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DRINKING WATER SURVEILLANCE PROGRAM

BELLE RIVER
WATER TREATMENT
PLANT

REPORT FOR 1991 AND 1992

⊗ Ontario

BELLE RIVER WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

REPORT FOR 1991 AND 1992

APRIL 1994

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PIBS 2960

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

BELLE RIVER WATER TREATMENT PLANT
1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a
monitoring program providing immediate, reliable, current
information on drinking water quality. The DWSP officially began in
April 1986 and is designed to include all municipal supplies in
Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being
monitored.

The Belle River water treatment plant is a conventional treatment
plant which treats water from Lake St. Clair. The process consists
of coagulation, flocculation, clarification (upflow clarifier),
filtration and disinfection. Powder activated carbon is added for
taste and odour control when required. This plant has a design
capacity of 18.0 x 1000 m^3/day. The Belle River water treatment
plant serves a population of approximately 13,000.

Water at the plant and at two locations in the distribution system
was sampled for the presence of approximately 180 parameters.
Parameters were divided into the following groups: bacteriological,
inorganic and physical (laboratory chemistry, field chemistry and
metals), organic (chloroaromatics, chlorophenols, pesticides and
PCB, phenolics, polyaromatic hydrocarbons and volatiles) and
radiological (radionuclides). Most laboratory analyses were
conducted at the Ministry of the Environment and Energy facilities
in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of
Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Belle River water treatment plant, for the sample years 1991
and 1992, produced good quality water and this was maintained in
the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

| | SITE | | | | | | | | | | | |
| | RAW | | | TREATED | | | SOUTH ST | | | WEST RIVER | | |
SCAN	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	45	28	62	16	1	6	2	0	0	12	0	0
CHEMISTRY (FIELD)	51	51	100	102	102	100	20	20	100	120	119	99
CHEMISTRY (LABORATORY)	402	374	93	406	305	75	82	70	85	479	403	84
METALS	407	166	40	408	119	29	92	33	35	552	185	33
CHLOROAROMATICS	168	0	0	168	0	0	14	0	0	98	0	0
CHLOROPHENOLS	29	0	0	24	0	0	.	.	.	.	.	.
PESTICIDES AND PCB	447	1	0	447	1	0	22	0	0	156	1	0
PHENOLICS	17	1	5	17	3	17	.	.	.	.	.	.
POLYAROMATIC HYDROCARBONS	136	0	0	102	0	0	.	.	.	85	0	0
SPECIFIC PESTICIDES	81	0	0	83	0	0	.	.	.	2	0	0
VOLATILES	505	0	0	505	68	13	62	8	12	350	48	13
RADIONUCLIDES	21	6	28	21	7	33	.	.	.	.	.	.
TOTAL	2,309	627		2,299	606		294	131		1,854	756	

DRINKING WATER SURVEILLANCE PROGRAM

BELLE RIVER WATER TREATMENT PLANT
1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Belle River water treatment plant in May of 1990. A previous DWSP annual report was published for 1990.

PLANT DESCRIPTION

The Belle River water treatment plant is a conventional treatment plant which treats water from Lake St. Clair. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. Powder activated carbon is added for taste and odour control when required. This plant has a design capacity of 18.0 x 1000 m^3/day. The Belle River water treatment plant serves a population of approximately 13,000.

The sample day flows ranged from 4.9 x 1000 m^3/day to 12.8 x 1000 m^3/day.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration.

Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative

sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:
        -THE TREATED AND DISTRIBUTED WATER;
        -ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
            GUIDELINE VALUES; AND
        -POSITIVE ORGANIC PARAMETERS DETECTED.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 12 of 31 treated and distributed water samples with a maximum reported value of 25.0°C.

CHEMISTRY (LABORATORY)

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in 8 of 30 treated and distributed water samples with a maximum reported value of 546 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in all 30 treated and distributed water samples with a maximum reported value of 249 mg/L.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 13 of 31 treated and distributed water samples with a maximum reported value of 350 ug/L.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PESTICIDES AND PCB

Hexachlorocyclopentadiene was found at positive levels in 2 of the 15 treated and distributed water samples analyzed. The maximum observed level was 74.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

Traces of pesticides including atrazine, desethyl atrazine, simazine, metolachlor and dicamba were detected. This is consistent with findings at other locations in the area.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at positive levels in 3 of the 17 treated and distributed water samples analyzed. The maximum observed level was 1.6 ug/L.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected above trace levels.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 31 treated and distributed water samples analyzed with a maximum level of 71.0 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

The presence of a number of pesticides which were detected at the Belle River water treatment plant indicates that this raw water source is adversely affected by agricultural activity.

The results are similar to those found in previous years.

No known health related guidelines were exceeded.

The Belle River water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

BELLE RIVER WATER TREATMENT PLANT
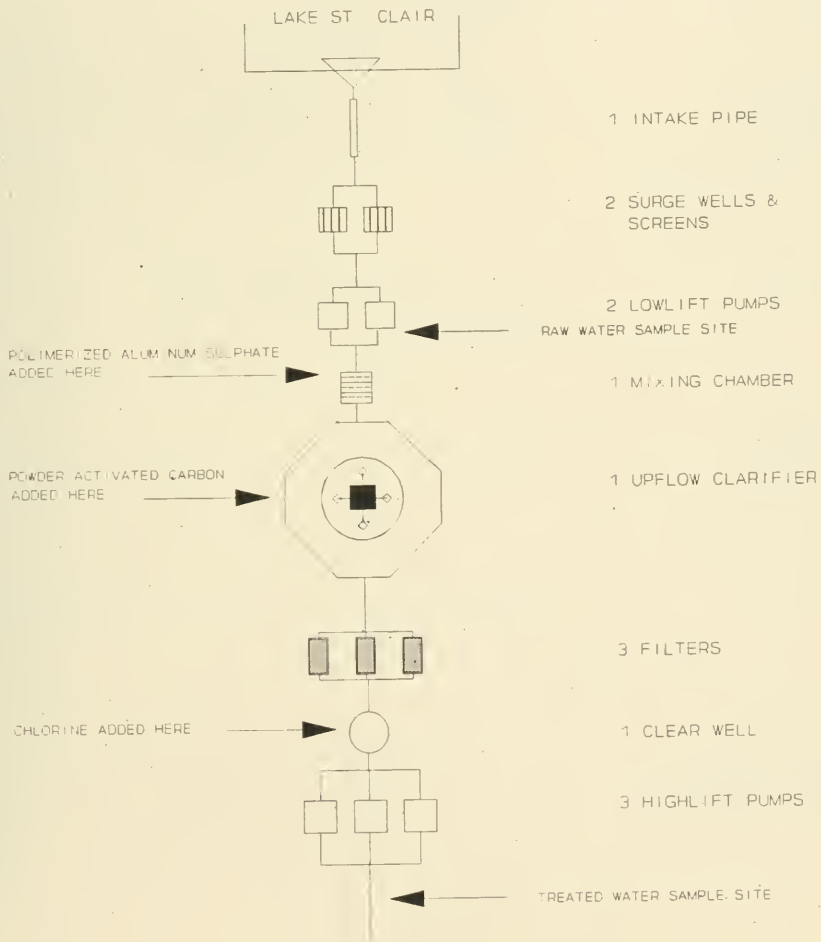
SCHEMATIC   CHARACTERISTICS

LAKE ST CLAIR

1 INTAKE PIPE

2 SURGE WELLS &
SCREENS

2 LOWLIFT PUMPS
RAW WATER SAMPLE SITE

POLIMERIZED ALUMINUM SULPHATE
ADDED HERE

1 MIXING CHAMBER

POWDER ACTIVATED CARBON
ADDED HERE

1 UPFLOW CLARIFIER

3 FILTERS

CHLORINE ADDED HERE

1 CLEAR WELL

3 HIGHLIFT PUMPS

TREATED WATER SAMPLE SITE

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

PLANT NAME: BELLE RIVER WTP
WORKS #:   220003412
UTM #:   173592504684575

DISTRICT: WINDSOR
REGION: SOUTHWEST
DISTRICT OFFICER: J. DRUMMOND

SUPERINTENDENT: ED RENAUD

ADDRESS: 497 LAKEVIEW DR. GEN. DEL.
                   BELLE RIVER, ONTARIO
                   NOR 1AO
                   519-728-1680

MUNICIPALITY: BELLE RIVER
AUTHORITY: MUNICIPAL

PLANT INFORMATION
_____

                   PLANT VOLUME: -   (X 1000 M3)
                   DESIGN CAPACITY: 18.000   (X 1000 M3/DAY)
                   RATED CAPACITY: -   (X 1000 M3/DAY)

MUNICIPALITY   POPULATION
------------   ----------
BELLE RIVER   3,600
TWP OF MAIDSTONE   3,420
TWP OF ROCHESTER   5,980

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER	LOCATION	FREQUENCY
FREE CHLORINE RESIDUAL	FILTERED	4 TIMES/DAY
	TREATED	4 TIMES/DAY
PH	RAW	DAILY READING
	TREATED	DAILY READING
TEMPERATURE	RAW	DAILY READING
	TREATED	DAILY READING
TURBIDITY	RAW	DAILY READING
	FILTERED	CONTINUOUS
	TREATED	CONTINUOUS

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM BELLE RIVER WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	COAGULATION POLYALUMINUM SILICATE SULPHATE	COAGULATION AID POLYELECTROLYTE	POST CHLORINATION CHLORINE	TASTE AND ODOUR ACTIVATED CARBON POWDER
91 JAN 22	.25	5.160	54.20	3.85	2.63	.
91 FEB 19	.00	5.340	39.30	3.31	2.55	.
91 MAR 19	.25	4.954	28.10	4.03	3.57	.
91 APR 16	.00	5.350	52.28	2.67	3.56	3.50
91 MAY 22	.50	7.790	53.90	2.29	2.91	5.05
91 JUN 18	.25	7.660	27.30	2.53	2.48	3.85
91 JUL 16	.25	12.800	38.20	1.51	2.27	11.00
91 AUG 20	.00	8.970	23.40	2.18	2.07	8.83
91 SEP 17	.00	8.290	25.30	2.38	1.91	.
91 OCT 22	.00	6.030	46.39	3.02	1.95	.
91 NOV 19	.00	5.300	13.10	3.20	2.14	.
92 FEB 18	.00	5.390	25.75	3.66	1.68	.
92 APR 21	.00	5.640	24.70	3.30	2.73	.
92 JUN 15	.00	10.750	19.50	1.11	2.28	.
92 AUG 17	.00	.000	31.90	.	2.82	.
92 NOV 17	.00	5.530	63.20	2.20	2.70	.
92 DEC 15	.00	5.400	38.80	2.10	3.02	.

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

A   ONTARIO DRINKING WATER OBJECTIVES (ODWO)
    1.   Maximum Acceptable Concentration (MAC)
    1+. MAC for Total Trihalomethanes
    2.   Interim Maximum Acceptable Concentration (IMAC)
    3.   Aesthetic Objective (AO)
    3*. AO for Total Xylenes
    4.   Recommended Operational Guideline
    5.   Health Related Guidance Value

B   HEALTH & WELFARE CANADA (H&W)
    1.   Maximum Acceptable Concentration (MAC)
    2.   Proposed MAC
    3.   Interim MAC
    4.   Aesthetic Objective (AO)

C   WORLD HEALTH ORGANIZATION (WHO)
    1.   Guideline Value (GV)
    2.   Tentative GV
    3.   Aesthetic GV

D   US ENVIRONMENTAL PROTECTION AGENCY (EPA)
    1.   Maximum Contaminant Level (MCL)
    2.   Suggested No-Adverse Effect Level (SNAEL)
    3.   Lifetime Health Advisory
    4.   EPA Ambient Water Quality Criteria

F   EUROPEAN ECONOMIC COMMUNITY (EEC)
    1.   Health Related Guideline Level
    2.   Aesthetic Guideline Level
    3.   Maximum Admissable Concentration (MADC)

G   CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I   NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!48	No Data: Sample Age Exceeded 48 Hours
!AR	No Data: No Numeric Results
!AW	No Data: Analysis Withdrawn
!BT	No Data: Sample Broken In Transit
!CS	No Data: Contamination Suspected
!EF	No Data: Laboratory Equipment Failure
!IR	No Data: Insufficient Sample
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedure Error: Sample Discarded
!PR	No Data: Preservative Required
!QU	No Data: Quality Control Unacceptable
!RE	No Data: Received Empty
!RO	No Data: No Numeric Results
!SM	No Data: Sample Missing
!SS	No Data: Sample Improperly Preserved
!U	No Data: Sample Unsuitable For Analysis
!UB	No Data: Bottle Broken
!UN	No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
FECAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = 0 (A1)	
1991 JAN	72	.	.	.	.	.
1991 FEB	BDL	.	.	.	.	.
1991 MAR	8	.	.	.	.	.
1991 APR	32	.	.	.	.	.
1991 JUN	BDL	.	.	.	.	.
1991 JUL	BDL	.	.	.	.	.
1991 AUG	BDL	.	.	.	.	.
1991 SEP	16	.	.	.	.	.
1991 OCT	4	.	.	.	.	.
1991 NOV	BDL	.	.	.	.	.
1992 FEB	BDL	.	.	.	.	.
1992 JUN	BDL	.	.	.	.	.
1992 AUG	12	.	.	.	.	.
1992 NOV	62	.	.	.	.	.
1992 DEC	BDL	.	.	.	.	.
STANDRD PLATE CNT MF (CT/ML)			DET'N LIMIT = 0		GUIDELINE = 500 (A3)	
1991 JAN	.	6 <=>	.	.	0 <=>	.
1991 FEB	.	2 <=>	.	.	0 <=>	.
1991 MAR	.	2 <=>	.	.	0 <=>	.
1991 APR	.	6 <=>	.	.	3 <=>	.
1991 MAY	.	4 <=>	.	.	0 <=>	.
1991 JUN	.	1 <=>	.	.	4 <=>	.
1991 JUL	.	0 <=>	.	.	2 <=>	.
1991 AUG	.	1 <=>	.	.	0 <=>	.
1991 SEP	.	1 <=>	.	.	0 <=>	.
1991 OCT	.	1 <=>	.	.	1 <=>	.
1991 NOV	.	3 <=>	.	.	1 <=>	.
1992 FEB	.	5 <=>	.	.	.	.
1992 JUN	.	3 <=>	.	.	.	.
1992 AUG	.	27 <=>	.	2 <=>	.	.
1992 NOV	.	0 <=>	.	2 <=>	.	.
1992 DEC	.		.		.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)	
1991 JAN	9000 A3C					
1991 FEB	80 <=>					
1991 MAR	170 A3C					
1991 APR	610 A3C					
1991 JUN	20 <=>					
1991 JUL	20 <=>					
1991 AUG	40 <=>					
1991 SEP	80 <=>					
1991 OCT	BDL					
1991 NOV	10 <=>					
1992 FEB	1600 A3C					
1992 JUN	20 <=>					
1992 AUG	40 <=>					
1992 NOV	15000 >					
1992 DEC	1100 <=>					
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = N/A	
1991 JAN	70000 A3C					
1991 FEB	680					
1991 MAR	4100 A3C					
1991 APR	20000 A3C					
1991 JUN	11000 A3C					
1991 JUL	4300 A3C					
1991 AUG	11000 A3C					
1991 SEP	8000 A3C					
1991 OCT	2100					
1991 NOV	2900					
1992 FEB	90000 A3C					
1992 JUN	16000 A3C					
1992 AUG	4900 A3C					
1992 NOV	20000 A3C					
1992 DEC	20700					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

CHEMISTRY (FIELD)

FLD CHLORINE (COMB) (MG/L)

DET'N LIMIT = 0   GUIDELINE = N/A

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN		.350			.300	.400
1991 FEB		.130			.300	.200
1991 MAR		.180			.300	.400
1991 APR		.170			.500	.200
1991 MAY		.100			.400	.400
1991 JUN		.120			.000	.100
1991 JUL		.080			.400	.200
1991 AUG		.090			.400	.200
1991 SEP		.920			.200	.200
1991 OCT		.080			.200	.400
1991 NOV		.170			.400	.400
1991 DEC		.160			.200	.200
1992 FEB		.090				
1992 APR		.090				
1992 JUN		.130				
1992 AUG		.120	.400			
1992 NOV		.120	.200	.200		
1992 DEC		.140		.100		

FLD CHLORINE FREE (MG/L)

DET'N LIMIT = 0   GUIDELINE = N/A

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN		.450			.500	.100
1991 FEB		1.000			1.000	.900
1991 MAR		.880			.700	.600
1991 APR		.450			.500	.100
1991 MAY		.870			.700	.700
1991 JUN		.470			.900	.900
1991 JUL		1.170			.900	.800
1991 AUG		.640			1.100	.800
1991 SEP		.140			.900	.800
1991 OCT		.730			.500	.600
1991 NOV		1.030			1.000	.800
1991 DEC		.690			.800	.700
1992 FEB		.590				
1992 APR		.600				
1992 JUN						
1992 AUG		.680				
1992 NOV		1.010	.500	.100		
1992 DEC		.940	.900	.100		

Page 16

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

FLD CHLORINE (TOTAL) (MG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = 0		GUIDELINE = N/A	
1991 JAN	.	.800	.	.	.800	.500
1991 FEB	.	1.130	.	.	1.300	1.100
1991 MAR	.	1.060	.	.	1.000	1.000
1991 APR	.	.620	.	.	1.000	.300
1991 MAY	.	.970	.	.	1.100	1.100
1991 JUN	.	.590	.	.	.900	1.000
1991 JUL	.	1.250	.	.	1.300	1.000
1991 AUG	.	.730	.	.	1.300	1.000
1991 SEP	.	1.060	.	.	1.100	1.000
1991 OCT	.	.810	.	.	.900	1.000
1991 NOV	.	1.200	.	.	1.300	1.000
1992 FEB	.	.850	.	.	1.000	.900
1992 APR	.	.600	.	.	.	.
1992 JUN	.	.690	.	.	.	.
1992 AUG	.	.810	.	.	.	.
1992 NOV	.	1.130	.900	.300	.	.
1992 DEC	.	1.080	1.100	.200	.	.

FLD PH (DMNSLESS)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1991 JAN	8.400	7.500	.	.	7.500	7.400
1991 FEB	7.500	7.100	.	.	7.400	7.400
1991 MAR	7.500	7.100	.	.	7.500	7.600
1991 APR	8.200	7.600	.	.	7.700	7.800
1991 MAY	8.100	7.500	.	.	7.400	7.400
1991 JUN	8.130	7.670	.	.	7.500	7.600
1991 JUL	9.110	7.980	.	.	7.600	7.600
1991 AUG	8.940	7.820	.	.	7.600	7.500
1991 SEP	8.960	7.960	.	.	7.600	7.600
1991 OCT	8.300	7.700	.	.	7.400	7.300
1991 NOV	8.210	7.760	.	.	7.400	7.500
1992 FEB	8.340	7.950	.	.	7.800	8.100
1992 APR	8.440	7.890	.	.	.	.
1992 JUN	8.310	7.820	.	.	.	.
1992 AUG	8.200	7.700	.	.	.	.
1992 NOV	8.240	7.410	7.000	7.200	.	.
1992 DEC	8.450	8.030	7.700	7.600	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

FLD TEMPERATURE (DEG.C)

CHEMISTRY (FIELD) DET'N LIMIT = N/A GUIDELINE = 15 (A3)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH-ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	1.000	3.000			3.000	13.000
1991 FEB	2.000	3.000			2.000	15.000
1991 MAR	4.000	5.000			4.000	11.000
1991 APR	9.000	10.000			8.500	12.000
1991 MAY	17.000	18.000			16.000	18.000
1991 JUN	24.000	24.000			20.000	19.000
1991 JUL	24.000	24.000			22.000	21.000
1991 AUG	24.000	25.000			22.000	23.000
1991 SEP	23.000	24.000			22.000	23.000
1991 OCT	10.000	12.000			11.000	16.000
1991 NOV	6.000	6.000			8.000	13.000
1992 FEB	2.000	3.000			2.000	11.000
1992 APR	13.000	11.000				
1992 JUN	21.000	21.000				
1992 AUG	20.000	20.000				
1992 NOV	4.000	5.000	11.000	14.000		
1992 DEC	2.500	3.000	7.000	10.000		

FLD TURBIDITY (FTU)

DET'N LIMIT = N/A GUIDELINE = 1.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH-ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	57.850	.110				
1991 FEB	9.780	.030				
1991 MAR	56.990	.060				
1991 APR	286.000	.050				
1991 MAY	35.930	.030				
1991 JUN	42.450	.040				
1991 JUL	21.570	.030				
1991 AUG	109.500	.050				
1991 SEP	37.340	.070				
1991 OCT	13.690	.030				
1991 NOV	25.700	.030				
1992 FEB	5.290	.040				
1992 APR	19.500	.060				
1992 JUN	83.980	.080				
1992 AUG	20.900	.090				
1992 NOV	109.700	.070				
1992 DEC	30.040	.050				

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

ALKALINITY (MG/L)

CHEMISTRY (LABORATORY)
DET'N LIMIT = 0.2
GUIDELINE = 30-500 (A4)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	119.200	103.600			104.700	103.900
1991 FEB	115.300	103.500			104.300	104.900
1991 MAR	138.400	129.500			131.900	129.400
1991 APR	153.900	180.500			172.300	170.100
1991 MAY	145.300	139.900			141.800	141.800
1991 JUN	93.200	86.700			84.500	84.900
1991 JUL	75.300	75.700			76.300	72.900
1991 AUG	76.000	74.100				70.800
1991 SEP	84.100	79.000			77.200	77.000
1991 OCT	89.100	82.100			81.300	81.200
1991 NOV	88.200	78.300			79.300	79.800
1992 FEB	98.500	95.400			96.800	97.200
1992 APR	131.000	140.800				
1992 JUN	92.700	89.000				
1992 AUG	132.900	132.500				
1992 NOV	97.200	71.900	75.100	73.300		
1992 DEC	129.300	130.500	126.200	128.400		

CALCIUM (MG/L)

DET'N LIMIT = 0.20
GUIDELINE = 100 (F2)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	50.600	50.800			51.200	50.200
1991 FEB	47.200	47.900			47.500	47.100
1991 MAR	54.200	54.300			55.500	55.300
1991 APR	62.400	73.400			74.800	75.400
1991 MAY	56.800	57.600			57.400	57.800
1991 JUN	33.600	34.800			33.400	34.200
1991 JUL	24.600	27.100			26.700	25.900
1991 AUG	26.000	29.000				26.400
1991 SEP	28.800	31.000			30.800	29.400
1991 OCT	30.600	31.800			31.800	32.200
1991 NOV	30.100	29.600			30.700	30.300
1992 FEB	39.400	41.300			41.000	40.700
1992 APR	55.600	64.300				
1992 JUN	30.700	32.500				
1992 AUG	53.000	56.350				
1992 NOV	34.200	36.350	36.600	36.450		
1992 DEC	47.000	50.750	49.300	50.400		

CYANIDE (MG/L)

DET'N LIMIT = 0.001
GUIDELINE = 0.2 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED
28 SAMPLES	BDL	BDL

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
CHLORIDE (MG/L)	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.20		GUIDELINE = 250 (A3)	
1991 JAN	23.300	24.300	.	.	25.100	25.500
1991 FEB	17.300	19.900	.	.	19.500	19.700
1991 MAR	26.400	27.300	.	.	28.600	28.100
1991 APR	16.200	17.400	.	.	30.800	30.800
1991 MAY	22.900	25.900	.	.	26.900	27.600
1991 JUN	11.200	13.900	.	.	13.100	13.300
1991 JUL	12.700	13.900	.	.	19.200	18.300
1991 AUG	13.500	14.100	.	.	.	16.300
1991 SEP	12.600	14.600	.	.	15.000	15.000
1991 OCT	9.000	11.200	.	.	11.200	11.300
1991 NOV	10.800	12.300	.	.	12.600	12.600
1992 FEB	18.600	23.500	.	.	22.900	21.900
1992 APR	34.000	36.700	.	.	.	.
1992 JUN	15.800	14.800	.	.	.	.
1992 AUG	30.900	35.800	.	.	.	.
1992 NOV	12.300	16.100	16.200	16.000	.	.
1992 DEC	15.000	18.800	18.200	18.600	.	.
COLOUR (HZU)			DET'N LIMIT = 0.50		GUIDELINE = 5 (A3)	
1991 JAN	30.500	2.500			2.500	2.500
1991 FEB	8.000	BDL			BDL	BDL
1991 MAR	6.500	2.000 <T			1.500 <T	2.000 <T
1991 APR	8.500	3.000			3.000	3.000
1991 MAY	4.500	BDL			BDL	BDL
1991 JUN	1.000 <T	.500 <T			.500 <T	.500 <T
1991 JUL	2.000	.500 <T			.500 <T	.500 <T
1991 AUG	BDL	BDL			BDL	BDL
1991 SEP	1.500	2.000			BDL	.500 <T
1991 OCT	1.000 <T	BDL			BDL	BDL
1991 NOV	BDL	BDL			BDL	BDL
1992 FEB	3.000	.500 <T			.500 <T	.500 <T
1992 APR	8.000	.500 <T				
1992 JUN	9.000	.500 <T				
1992 AUG	7.500	2.500				
1992 NOV	21.000	2.000	1.000 <T	2.000		
1992 DEC	11.000	2.000	2.000	2.500		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
CONDUCTIVITY (UMHO/CM)	CHEMISTRY (LABORATORY)		DET'N LIMIT = 1.0		GUIDELINE = 400 (F2)	
1991 JAN	385	383	.	.	390	390
1991 FEB	343	351	.	.	349	351
1991 MAR	426	422	.	.	430	425
1991 APR	433	546	.	.	529	523
1991 MAY	412	408	.	.	417	418
1991 JUN	262	274	.	.	265	266
1991 JUL	224	242	.	.	265	257
1991 AUG	225	236	.	.	.	241
1991 SEP	244	256	.	.	255	254
1991 OCT	237	245	.	.	245	244
1991 NOV	243	245	.	.	247	248
1992 FEB	317	339	.	.	163	321
1992 APR	507	500	.	.	.	.
1992 JUN	272	275	.	.	.	.
1992 AUG	459	489	.	.	.	.
1992 NOV	263	290	292	289	.	.
1992 DEC	351	380	371	378	.	.
DISS ORG CARBON (MG/L)			DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)	
1991 JAN	4.500	2.700	.	.	2.900	3.000
1991 FEB	2.700	1.700	.	.	1.800	1.800
1991 MAR	3.600	2.500	.	.	2.700	2.800
1991 APR	3.600	3.100	.	.	3.100	2.900
1991 MAY	3.200	1.800	.	.	2.000	2.200
1991 JUN	2.100	1.400	.	.	1.200	1.300
1991 JUL	2.600	1.300	.	.	1.300	1.300
1991 AUG	2.800	1.300	.	.	.	1.300
1991 SEP	2.500	1.200	.	.	1.100	1.200
1991 OCT	1.800	1.200	.	.	1.200	1.200
1991 NOV	1.600	1.100	.	.	1.100	1.200
1992 FEB	1.800	1.400	.	.	1.500	1.400
1992 APR	3.300	2.200	.	.	.	.
1992 JUN	2.200	1.400	.	.	.	.
1992 AUG	3.800	3.000	.	.	.	.
1992 NOV	3.200	1.700	1.800	1.900	.	.
1992 DEC	3.000	2.200	2.300	2.300	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
FLUORIDE (MG/L	CHEMISTRY (LABORATORY))		DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 JAN	.140	.120			.120	.120
1991 FEB	.100	.100			.100	.100
1991 MAR	.120	.120			.120	.120
1991 APR	.140	.160			.140	.140
1991 MAY	.140	.100			.080	.080
1991 JUN	.100	.100			.100	.100
1991 JUL	.100	.100			.100	.100
1991 AUG	.100	.080				.100
1991 SEP	.140	.140			.140	.140
1991 OCT	.100	.080			.080	.100
1991 NOV	.100	.080			.080	.080
1992 FEB	.100	.100			.100	.100
1992 APR	.160	.140				
1992 JUN	.100	.080				
1992 AUG	.140	.160				
1992 NOV	.120	.080	.060	.060		
1992 DEC	.100	.120	.120	.140		
HARDNESS (MG/L	)		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 JAN	178.200	174.700			176.200	174.800
1991 FEB	161.200	163.700			162.200	161.100
1991 MAR	186.400	185.100			188.400	185.800
1991 APR	208.000	247.000			249.000	250.000
1991 MAY	198.000	198.000			200.000	199.000
1991 JUN	121.000	125.000			119.000	122.000
1991 JUL	101.000	102.200			105.900	102.200
1991 AUG	102.000	108.000				103.000
1991 SEP	109.000	115.000			114.000	111.000
1991 OCT	110.000	112.000			112.000	113.000
1991 NOV	108.800	107.000			109.900	108.900
1992 FEB	141.000	146.000			146.000	146.000
1992 APR	195.000	228.300				
1992 JUN	117.000	118.000				
1992 AUG	193.540	203.900				
1992 NOV	120.470	125.190	125.470	125.160		
1992 DEC	161.680	171.200	229.670	170.710		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
IONCAL (DMNSLESS)	**CHEMISTRY (LABORATORY)**		DET'N LIMIT = N/A		GUIDELINE = N/A	
1991 JAN	1.366	2.494			1.986	.785
1991 FEB	2.011 NAF	1.336 NAF			2.258 NAF	1.226 NAF
1991 MAR	4.977 NAF	2.638 NAF			3.712 NAF	2.559 NAF
1991 APR	6.366 NAF	3.482 NAF			.277 NAF	1.916 NAF
1991 MAY	1.705 NAF	1.401 NAF			1.586 NAF	2.543 NAF
1991 JUN	2.514 NAF	1.901 NAF			.927 NAF	2.333 NAF
1991 JUL	.578 NAF	3.862 NAF			6.056 NAF	6.060 NAF
1991 AUG	3.664	3.416			.000 NAF	.051
1991 SEP	3.594 NAF	4.275 NAF			4.858 NAF	2.848 NAF
1991 OCT	3.139	1.596			2.239	2.948
1991 NOV	.692	.771			2.280	1.547
1992 FEB	4.593	3.716			3.094	3.497
1992 APR	4.686	2.639				
1992 JUN	2.154 NAF	3.246 NAF				
1992 AUG	.432	.944				
1992 NOV	.906	1.356	1.950	2.456		
1992 DEC	1.634	4.209	3.471	2.963		
POTASSIUM (MG/L)			DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)	
1991 JAN	2.780	2.160			2.180	2.180
1991 FEB	1.850	1.770			1.730	1.760
1991 MAR	2.120	1.950			1.950	1.980
1991 APR	2.400	2.750			2.600	2.550
1991 MAY	2.100	1.900			2.000	2.000
1991 JUN	1.450	1.350			1.400	1.300
1991 JUL	1.050	1.120			1.440	1.350
1991 AUG	1.200	1.050				1.150
1991 SEP	1.250	1.200			1.200	1.150
1991 OCT	1.350	1.300			1.350	1.250
1991 NOV	1.290	1.140			1.190	1.180
1992 FEB	1.390	1.390			1.540	1.360
1992 APR	2.567	2.469				
1992 JUN	1.470	1.140				
1992 AUG	2.833	2.962				
1992 NOV	3.026	2.273	2.314	2.227		
1992 DEC	2.729	2.599	2.527	2.572		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

CHEMISTRY (LABORATORY)
LANGELIERS INDEX (DMNSLESS)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = N/A		GUIDELINE = N/A	
1991 JAN	.481	.272			.329	.337
1991 FEB	.600 NAF	.299 NAF			.309 NAF	.307 NAF
1991 MAR	.801	.774			.781	.781
1991 APR	.778	.897			.896	.855
1991 MAY	.804	.724			.718	.731
1991 JUN	.292	.171			.245	.177
1991 JUL	.048 NAF	.096				-.016
1991 AUG	.276	.028			.004	-.054
1991 SEP	.497	.197				.134
1991 OCT	.281	-.109			.155	.110
1991 NOV	.057	-.053			.115	-.095
1992 FEB	.546	.440			-.022	.494
1992 APR	.791	.666			.473	
1992 JUN	.156	.372				
1992 AUG	.801	.673				
1992 NOV	.287	-.178	-.107	-.148		
1992 DEC	.667	.502	.466	.472		

MAGNESIUM (MG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)	
1991 JAN	12.600	11.600			11.750	12.000
1991 FEB	10.550	10.700			10.550	10.550
1991 MAR	12.400	12.000			12.100	11.600
1991 APR	12.700	15.500			15.100	15.100
1991 MAY	13.600	13.100			13.800	13.400
1991 JUN	9.000	9.200			8.700	8.900
1991 JUL	8.800	8.350			9.550	9.100
1991 AUG	9.000	8.700				9.000
1991 SEP	9.100	9.200			9.100	9.100
1991 OCT	8.200	8.000			7.900	8.000
1991 NOV	8.150	8.050			8.100	8.100
1992 FEB	10.300	10.500			10.600	10.700
1992 APR	13.620	16.380				
1992 JUN	9.880	8.880				
1992 AUG	14.880	15.360				
1992 NOV	8.510	8.370	8.280	8.290		
1992 DEC	10.780	10.800	10.680	10.900		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
SODIUM (MG/L)	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)	
1991 JAN	10.000	9.400	.	.	9.800	9.900
1991 FEB	7.900	8.000	.	.	7.900	7.800
1991 MAR	12.700	12.300	.	.	12.200	12.500
1991 APR	11.800	15.000	.	.	14.600	14.400
1991 MAY	12.200	12.000	.	.	12.800	12.600
1991 JUN	6.200	6.200	.	.	6.000	6.000
1991 JUL	6.800	6.900	.	.	9.300	8.500
1991 AUG	7.800	6.800	.	.	.	8.200
1991 SEP	8.000	7.800	.	.	.	8.400
1991 OCT	6.200	5.800	.	.	8.400	8.400
1991 NOV	6.400	6.100	.	.	6.200	5.600
1992 FEB	10.400	11.700	.	.	6.400	6.300
1992 APR	16.910	17.390	.	.	11.500	10.900
1992 JUN	9.240	7.270	.	.	.	.
1992 AUG	15.770	16.860	.	.	.	.
1992 NOV	5.820	6.130	6.140	6.090	.	.
1992 DEC	7.070	7.400	7.260	7.390	.	.
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
1991 JAN	.042	.002 <T	.	.	.006 <T	.006 <T
1991 FEB	.002 <T	.002 <T	.	.	BDL	.002 <T
1991 MAR	.022	BDL	.	.	BDL	BDL
1991 APR	.006 <T	.008 <T	.	.	.006 <T	.004 <T
1991 MAY	.018	BDL	.	.	.002 <T	.004 <T
1991 JUN	.042	BDL	.	.	BDL	BDL
1991 JUL	.030	.008 <T	.	.	.006 <T	.012
1991 AUG	.004 <T	BDL	.	.	BDL	BDL
1991 SEP	.012	BDL	.	.	.004 <T	BDL
1991 OCT	.002 <T	BDL	.	.	BDL	BDL
1991 NOV	.012	BDL	.	.	BDL	BDL
1992 FEB	.028	.006 <T	.	.	.004 <T	.006 <T
1992 APR	.036	.008 <T	.	.	.	.
1992 JUN	.044	BDL	.	.	.	.
1992 AUG	.044	.004 <T	.	.	.	.
1992 NOV	BDL	.002 <T	.004 <T	.006 <T	.	.
1992 DEC	.048	BDL	BDL	BDL	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

NITRITE (MG/L)

CHEMISTRY (LABORATORY)

DET'N LIMIT = 0.001   GUIDELINE = 1.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	.048	.001 <T			.001 <T	BDL
1991 FEB	.011	BDL			BDL	BDL
1991 MAR	.031	BDL			BDL	BDL
1991 APR	.068	.001 <T			BDL	BDL
1991 MAY	.037	BDL			BDL	.001 <T
1991 JUN	.023	BDL			BDL	BDL
1991 JUL	.004 <T	BDL				BDL
1991 AUG	.005	BDL			BDL	BDL
1991 SEP	.005	BDL			BDL	BDL
1991 OCT	.004 <T	BDL			BDL	BDL
1991 NOV	.004 <T	BDL			BDL	BDL
1992 FEB	.009	BDL				
1992 APR	.035	.001 <T				
1992 JUN	.013	BDL				
1992 AUG	.033	.001 <T				
1992 NOV	.037	BDL	BDL	.001 <T		
1992 DEC	.016	BDL	BDL	BDL		

NITRATE (TOTAL) (MG/L)

DET'N LIMIT = 0.005   GUIDELINE = 10.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	2.940	3.000			3.060	3.060
1991 FEB	2.210	2.190			2.210	2.210
1991 MAR	3.450	3.680			3.800	3.660
1991 APR	3.340	5.060			4.800	4.570
1991 MAY	2.650	2.530			2.620	2.640
1991 JUN	.815	.900			.750	.780
1991 JUL	.050	.080			.250	.200
1991 AUG	.015 <T	.105				.025
1991 SEP	.025	.050			.030	.035
1991 OCT	.230	.250			.240	.245
1991 NOV	.380	.370			.380	.370
1992 FEB	1.510	1.590			1.820	1.550
1992 APR	4.850	4.320				
1992 JUN	.590	.560				
1992 AUG	4.540	4.700				
1992 NOV	.905	1.020	1.030	1.010		
1992 DEC	1.830	2.260	2.090	2.160		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

CHEMISTRY (LABORATORY)

NITROGEN TOT KJELD (MG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = 0.02		GUIDELINE = N/A	
1991 JAN	.580	.360			.380	.360
1991 FEB	.410	.230			.250	.220
1991 MAR	.590	.330			.310	.310
1991 APR	2.150	.900				1.800
1991 MAY	.380	.190			.190	.200
1991 JUN	.290	.160			.130	.120
1991 JUL	.280	.080 <T			.110	.160
1991 AUG	.260	.110				.070 <T
1991 SEP	.420	.100			BDL	.120
1991 OCT	.260	.140			.190	.140
1991 NOV	.210	.160			.140	.120
1992 FEB	.340				.170	.210
1992 APR	.550	.330				
1992 JUN	.420	.200				
1992 AUG	.630	.400				
1992 NOV	.550	.180	.220	.210		
1992 DEC	.490	.260	.350	.350		

PH (DMNSLESS)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1991 JAN	8.150	8.000			8.050	8.070
1991 FEB	8.310	8.050			8.060	8.060
1991 MAR	8.380	8.380			8.370	8.380
1991 APR	8.250	8.240			8.250	8.210
1991 MAY	8.340	8.270			8.260	8.270
1991 JUN	8.220	8.120			8.220	8.140
1991 JUL	8.190	8.200			8.120	8.130
1991 AUG	8.390	8.110				8.090
1991 SEP	8.530	8.230			8.200	8.200
1991 OCT	8.260	8.110			8.120	8.110
1991 NOV	8.050	8.000			8.010	7.940
1992 FEB	8.400	8.290			8.260	8.340
1992 APR	8.390	8.170				
1992 JUN	8.130	8.340				
1992 AUG	8.410	8.260				
1992 NOV	8.190	7.840	7.890	7.860		
1992 DEC	8.330	8.130	8.120	8.110		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING

CHEMISTRY (LABORATORY)

PHOSPHORUS FIL REACT (MG/L)   DET'N LIMIT = 0.0005   GUIDELINE = N/A

	RAW	TREATED				
1991 JAN	.045	.001 <T	.	.	.	.
1991 FEB	.003	.000 <T	.	.	.	.
1991 MAR	.033	.003	.	.	.	.
1991 APR	.052	.001 <T	.	.	.	.
1991 MAY	.005	BDL	.	.	.	.
1991 JUN	.015	.000 <T	.	.	.	.
1991 JUL	.004	BDL	.	.	.	.
1991 AUG	.011	BDL	.	.	.	.
1991 SEP	.004	BDL	.	.	.	.
1991 OCT	.001 <T	BDL	.	.	.	.
1991 NOV	.002	BDL	.	.	.	.
1992 FEB	.002 <T	BDL	.	.	.	.
1992 APR	.001 <T	BDL	.	.	.	.
1992 JUN	.006	BDL	.	.	.	.
1992 AUG	.003 <T	BDL	.	.	.	.
1992 NOV	.054	BDL	.	.	.	.
1992 DEC	.029	.001 <T	.	.	.	.

PHOSPHORUS TOTAL (MG/L)   DET'N LIMIT = 0.002   GUIDELINE = 0.40 (F2)

	RAW	TREATED				
1991 JAN	.086	BDL	.	.	.	.
1991 FEB	.020	BDL	.	.	.	.
1991 MAR	.087	.005 <T	.	.	.	.
1991 APR	.055	.025	.	.	.	.
1991 MAY	.033	BDL	.	.	.	.
1991 JUN	.043	BDL	.	.	.	.
1991 JUL	.024	BDL	.	.	.	.
1991 AUG	.037	BDL	.	.	.	.
1991 SEP	.041	BDL	.	.	.	.
1991 OCT	.014	BDL	.	.	.	.
1991 NOV	.014	BDL	.	.	.	.
1992 FEB	.014	BDL	.	.	.	.
1992 APR	.021	BDL	.	.	.	.
1992 JUN	.071	.007 <T	.	.	.	.
1992 AUG	.028	.004 <T	.	.	.	.
1992 NOV	.112	.004 <T	.	.	.	.
1992 DEC	.043	.007 <T	.	.	.	.

CHEMISTRY (LABORATORY)

RESIDUE FILTRATE (MG/L)   DET'N LIMIT = N/A   GUIDELINE = 500 (A3)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	250.000 CRO	249.000 CRO			253.000 CRO	253.000 CRO
1991 FEB	223.000 CRO	228.000 CRO			227.000 CRO	228.000 CRO
1991 MAR	277.000 CRO	274.000 CRO			280.000 CRO	276.000 CRO
1991 APR	281.000 CRO	355.000 CRO			344.000 CRO	340.000 CRO
1991 MAY	268.000 CRO	265.000 CRO			271.000 CRO	272.000 CRO
1991 JUN	170.000 CRO	178.000 CRO			172.000 CRO	173.000 CRO
1991 JUL	146.000 CRO	157.000 CRO			172.000 CRO	167.000 CRO
1991 AUG	146.000 CRO	153.000 CRO				157.000 CRO
1991 SEP	159.000 CRO	166.000 CRO			166.000 CRO	165.000 CRO
1991 OCT	154.000 CRO	159.000 CRO			159.000 CRO	159.000 CRO
1991 NOV	158.000 CRO	159.000 CRO			161.000 CRO	161.000 CRO
1992 FEB	206.000 CRO	220.000 CRO			106.000 CRO	209.000 CRO
1992 APR	330.000 CRO	325.000 CRO				
1992 JUN	182.000 CRO	179.000 CRO				
1992 AUG	298.000 CRO	318.000 CRO				
1992 NOV	171.000 CRO	189.000 CRO	190.000 CRO	188.000 CRO		
1992 DEC	228.000	247.000	241.000	246.000		

SULPHATE (MG/L)   DET'N LIMIT = 0.20   GUIDELINE = 500 (A3)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	36.770	42.590			43.540	44.820
1991 FEB	28.410	44.480			36.170	35.950
1991 MAR	37.940	37.080			37.990	37.300
1991 APR	32.570	48.530			48.280	47.750
1991 MAY	34.690	42.150			43.220	43.260
1991 JUN	20.270	26.680			26.010	26.040
1991 JUL	20.250	26.330			30.240	29.110
1991 AUG	20.180	24.800				27.150
1991 SEP	20.970	27.310			28.260	27.500
1991 OCT	18.120	24.750			25.290	24.390
1991 NOV	17.890	22.880			23.210	22.460
1992 FEB	26.670	31.740			30.850	30.370
1992 APR	47.730	51.860				
1992 JUN	24.310	26.290				
1992 AUG	38.270	44.980				
1992 NOV	19.540	43.300	41.190	43.410		
1992 DEC	25.580	32.140	31.790	31.980		

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

TABLE 4

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
CHEMISTRY (LABORATORY)			DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)	
TURBIDITY (FTU)						
1991 JAN	.310	.300	.	.	.700	.470
1991 FEB	5.800 RRV	.100	.	.	.050	.100
1991 MAR	53.000	.120	.	.	.110	.180
1991 APR	160.000	.260	.	.	.160 <T	.320
1991 MAY	22.000	.080 <T	.	.	.170 <T	.140 <T
1991 JUN	17.000	.190	.	.	.100	.170
1991 JUL	9.200	.160	.	.	.070	.100
1991 AUG	35.000	.350	.	.		.140
1991 SEP	26.000	.460	.	.	.180	.200
1991 OCT	3.900	.070 <T	.	.	BDL	BDL
1991 NOV	10.600	.240 <T	.	.	.240 <T	.230 <T
1992 FEB	3.800	BDL	.	.	.100 <T	.090 <T
1992 APR	14.200	.370	.	.	.	.
1992 JUN	58.000	.290	.	.	.	.
1992 AUG	11.000	.480	.	.	.	.
1992 NOV	95.000	.220 <T	.230 <T	.400	.	.
1992 DEC	22.100	.210 <T	.200 <T	.170 <T	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
METALS						
SILVER (UG/L))	BDL	BDL	DET'N LIMIT = 0.05 / BDL	BDL	GUIDELINE = N/A / BDL	BDL
62 SAMPLES						
ALUMINUM (UG/L))			DET'N LIMIT = 0.10		GUIDELINE = 100 (A4)	
1991 JAN	390.000	22.000	.	.	22.000	23.000
1991 FEB	79.000	31.000	.	.	29.000	29.000
1991 MAR	430.000	51.000	.	.	57.000	47.000
1991 APR	880.000	74.000	.	.	92.000	82.000
1991 MAY	250.000	120.000	.	.	110.000	110.000
1991 JUN	300.000	160.000	.	.	150.000	130.000
1991 JUL	150.000	350.000	.	.	340.000	330.000
1991 AUG	280.000	220.000	.	.	300.000	260.000
1991 SEP	220.000	300.000	.	.	330.000	260.000
1991 OCT	95.000	58.000	.	.	53.000	54.000
1991 NOV	120.000	38.000	.	.	39.000	49.000
1992 FEB	55.000	56.000	.	.	48.000	50.000
1992 APR	160.000	120.000	.	.	.	.
1992 JUN	290.000	210.000	.	.	.	.
1992 AUG	160.000	250.000	.	.	.	.
1992 NOV	760.000	17.000	18.000	18.000	.	.
1992 DEC	210.000	40.000	35.000	32.000	.	.
ARSENIC (UG/L))			DET'N LIMIT = 0.10		GUIDELINE = 25 (A1)	
1991 JAN	.560 <T	BDL	.	.	.190 <T	BDL
1991 FEB	.390 <T	BDL	.	.	.200 <T	.160 <T
1991 MAR	.560 <T	BDL	.	.	.380 <T	BDL
1991 APR	.680 <T	BDL	.	.	BDL	BDL
1991 MAY	.430 <T	BDL	.	.	BDL	BDL
1991 JUN	.950 <T	.270 <T	.	.	.300 <T	.350 <T
1991 JUL	.890 <T	.360 <T	.	.	BDL	.440 <T
1991 AUG	1.300	.530 <T	.	.	.490 <T	.510 <T
1991 SEP	.580 <T	.130 <T	.	.	.180 <T	.190 <T
1991 OCT	.510 <T	.360 <T	.	.	.170 <T	.360 <T
1991 NOV	.530 <T	.290 <T	.	.	.210 <T	.290 <T
1992 FEB	.330 <T	.280 <T	.	.	.110 <T	.320 <T
1992 APR	.320 <T	BDL	.	.	.	.
1992 JUN	.760 <T	.380 <T	.	.	.	.
1992 AUG	.890 <T	.950 <T	.	.	.	.
1992 NOV	.760 <T	.190 <T	.280 <T	.240 <T	.	.
1992 DEC	.740 <T	.210 <T	.300 <T	.320 <T	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
BARIUM (UG/L)	METALS		DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)	
1991 JAN	23.000	17.000	.	.	18.000	18.000
1991 FEB	17.000	16.000	.	.	15.000	16.000
1991 MAR	25.000	18.000	.	.	19.000	18.000
1991 APR	45.000	28.000	.	.	27.000	26.000
1991 MAY	26.000	26.000	.	.	23.000	24.000
1991 JUN	20.000	17.000	.	.	18.000	18.000
1991 JUL	15.000	18.000	.	.	17.000	18.000
1991 AUG	19.000	18.000	.	.	20.000	19.000
1991 SEP	17.000	19.000	.	.	19.000	19.000
1991 OCT	16.000	14.000	.	.	14.000	14.000
1991 NOV	16.000	19.000	.	.	14.000	15.000
1992 FEB	19.000	23.000	.	.	18.000	18.000
1992 APR	26.000	17.000	.	.	.	.
1992 JUN	20.000	20.000	.	.	.	.
1992 AUG	32.000	32.000	.	.	.	.
1992 NOV	25.000	22.000	23.000	24.000	.	.
1992 DEC	23.000	20.000	20.000	21.000	.	.
BORON (UG/L)			DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)	
1991 JAN	27.000	21.000	.	.	28.000	27.000
1991 FEB	16.000 <T	19.000 <T	.	.	19.000 <T	20.000 <T
1991 MAR	22.000	20.000 <T	.	.	21.000	19.000 <T
1991 APR	19.000 <T	23.000	.	.	29.000	27.000
1991 MAY	26.000	27.000	.	.	29.000	29.000
1991 JUN	21.000	17.000 <T	.	.	19.000 <T	18.000 <T
1991 JUL	23.000	25.000	.	.	23.000	25.000
1991 AUG	21.000	20.000 <T	.	.	29.000	28.000
1991 SEP	18.000 <T	21.000	.	.	27.000	32.000
1991 OCT	19.000 <T	18.000 <T	.	.	19.000 <T	19.000 <T
1991 NOV	17.000 <T	15.000 <T	.	.	15.000 <T	15.000 <T
1992 FEB	17.000 <T	19.000 <T	.	.	17.000 <T	17.000 <T
1992 APR	30.000	33.000	.	.	.	.
1992 JUN	19.000 <T	17.000 <T	.	.	.	.
1992 AUG	42.000	65.000	.	.	.	.
1992 NOV	23.000	26.000	27.000	28.000	.	.
1992 DEC	23.000	20.000 <T	23.000	24.000	.	.

METALS

BERYLLIUM (UG/L)

GUIDELINE = 6800 (D4) DET'N LIMIT = 0.05

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	.070 <T	BDL	.	.	BDL	BDL
1991 FEB	BDL	BDL	.	.	BDL	BDL
1991 MAR	.110 <T	BDL	.	.	BDL	BDL
1991 APR	.100 <T	BDL	.	.	BDL	BDL
1991 MAY	BDL	BDL	.	.	BDL	BDL
1991 JUN	BDL	BDL	.	.	BDL	BDL
1991 JUL	.110 <T	.100 <T	.	.	BDL	.080 <T
1991 AUG	.070 <T	BDL	.	.	BDL	BDL
1991 SEP	BDL	BDL	.	.	BDL	BDL
1991 OCT	BDL	BDL	.	.	BDL	BDL
1991 NOV	BDL	BDL	.	.	BDL	BDL
1992 FEB	BDL	BDL	.	.	.070 <T	BDL
1992 APR	BDL	BDL	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	BDL	.100 <T	.	.	.	.
1992 NOV	.090 <T	BDL	BDL	BDL	.	.
1992 DEC	.070 <T	BDL	BDL	BDL	.	.

CADMIUM (UG/L)

GUIDELINE = 5.0 (A1) DET'N LIMIT = 0.05

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	BDL	.	.	BDL	BDL
1991 FEB	.070 <T	BDL	.	.	BDL	BDL
1991 MAR	BDL	BDL	.	.	BDL	BDL
1991 APR	.140 <T	BDL	.	.	BDL	BDL
1991 MAY	.070 <T	BDL	.	.	BDL	BDL
1991 JUN	BDL	BDL	.	.	BDL	BDL
1991 JUL	BDL	BDL	.	.	BDL	BDL
1991 AUG	BDL	BDL	.	.	BDL	BDL
1991 SEP	BDL	BDL	.	.	BDL	BDL
1991 OCT	BDL	BDL	.	.	BDL	BDL
1991 NOV	.120 <T	BDL	.	.	BDL	BDL
1992 FEB	BDL	BDL	.	.	.	.
1992 APR	.180 <T	.070 <T	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	BDL	BDL	BDL	BDL	.	.
1992 NOV	.080 <T	BDL	BDL	BDL	.	.
1992 DEC	BDL	BDL	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

COBALT (UG/L) METALS — DET'N LIMIT = 0.02 — GUIDELINE = N/A

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	.270 <T	.100 <T			.130 <T	.090 <T
1991 FEB	.130 <T	.130 <T			.140 <T	.130 <T
1991 MAR	.440 <T	.190 <T			.110 <T	.110 <T
1991 APR	.900 <T	BDL			BDL	BDL
1991 MAY	.460 <T	.200 <T			.170 <T	.120 <T
1991 JUN	.340 <T	.080 <T			.080 <T	.080 <T
1991 JUL	.510 <T	.420 <T			.500 <T	.320 <T
1991 AUG	.540 <T	.110 <T			.100 <T	.080 <T
1991 SEP	.330 <T	.120 <T			.130 <T	.110 <T
1991 OCT	.160 <T	.080 <T			.060 <T	.070 <T
1991 NOV	.190 <T	.150 <T			.090 <T	.070 <T
1992 FEB	.180 <T	.170 <T			.110 <T	.130 <T
1992 APR	.460 <T	.260 <T				
1992 JUN	.660 <T	.270 <T				
1992 AUG	.440 <T	.290 <T				
1992 NOV	.560 <T	.190 <T	.190 <T	.140 <T		
1992 DEC	.230 <T	.060 <T	.060 <T	.070 <T		

CHROMIUM (UG/L) DET'N LIMIT = 0.50 — GUIDELINE = 50.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	3.400 <T	1.200 <T			3.000 <T	2.800 <T
1991 FEB	.810 <T	1.600 <T			1.700 <T	1.900 <T
1991 MAR	2.900 <T	2.400 <T			2.400 <T	1.900 <T
1991 APR	1.300 <T	BDL			BDL	BDL
1991 MAY	3.100 <T	2.100 <T			1.300 <T	1.300 <T
1991 JUN	2.500 <T	BDL			.510 <T	.690 <T
1991 JUL	2.400 <T	1.700 <T			BDL	.820 <T
1991 AUG	1.500 <T	BDL			1.300 <T	1.300 <T
1991 SEP	.780 <T	BDL			.640 <T	2.400 <T
1991 OCT	1.800 <T	1.700 <T			1.700 <T	1.600 <T
1991 NOV	.960 <T	.580 <T			BDL	BDL
1992 FEB	BDL	BDL			BDL	BDL
1992 APR	1.700 <T	1.300 <T				
1992 JUN	.750 <T	BDL				
1992 AUG	.550 <T	2.600 <T				
1992 NOV	2.300 <T	2.000 <T	2.200 <T	2.100 <T		
1992 DEC	3.500 <T	1.300 <T	3.000 <T	3.400 <T		

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING

COPPER (UG/L)

DET'N LIMIT = 0.50 GUIDELINE = 1000 (A3)

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
1991 JAN	2.100 <T	.860 <T			3.100 <T	9.900
1991 FEB	1.200 <T	.670 <T			2.200 <T	2.400 <T
1991 MAR	2.300 <T	.970 <T			2.000 <T	7.900
1991 APR	3.900 <T	1.200 <T			2.900 <T	15.000
1991 MAY	3.100 <T	.550 <T			3.800 <T	7.100
1991 JUN	1.500 <T	.660 <T			2.700 <T	7.500
1991 JUL	1.300 <T	BDL			2.400 <T	5.900
1991 AUG	1.800 <T	BDL			1.800 <T	2.700 <T
1991 SEP	1.300 <T	BDL			1.100 <T	3.300 <T
1991 OCT	.960 <T	BDL			1.800 <T	5.300
1991 NOV	1.000 <T	BDL			2.400 <T	22.000
1992 FEB	1.700 <T	.720 <T			2.200 <T	7.100
1992 APR	1.400 <T	1.900 <T				
1992 JUN	2.300 <T	.850 <T				
1992 AUG	2.400 <T	1.300 <T				
1992 NOV	2.600 <T	.790 <T	3.500 <T	15.000		
1992 DEC	1.700 <T	.770 <T	1.800 <T	4.800 <T		

IRON (UG/L)

DET'N LIMIT = 6.00 GUIDELINE = 300 (A3)

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
1991 JAN	380.000	BDL			BDL	BDL
1991 FEB	93.000	BDL			BDL	BDL
1991 MAR	490.000	BDL			BDL	99.000
1991 APR	1100.000	BDL			BDL	BDL
1991 MAY	310.000	BDL			BDL	8.000 <T
1991 JUN	440.000	BDL			BDL	BDL
1991 JUL	210.000	6.800 <T			6.900 <T	BDL
1991 AUG	590.000	BDL			BDL	BDL
1991 SEP	350.000	BDL			BDL	BDL
1991 OCT	150.000	BDL			BDL	BDL
1991 NOV	200.000	BDL			BDL	6.800 <T
1992 FEB	61.000	8.300 <T				
1992 APR	220.000	BDL				
1992 JUN	540.000	BDL				
1992 AUG	200.000	BDL				
1992 NOV	520.000	BDL	13.000 <T	26.000 <T		
1992 DEC	290.000	BDL	6.400 <T	BDL		

MERCURY (UG/L)

DET'N LIMIT = 0.02 GUIDELINE = 1.0 (A1)

	RAW	TREATED
33 SAMPLES	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
MANGANESE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)	
1991 JAN	12.000	2.700			3.000	2.700
1991 FEB	3.500	.830			.890	.880
1991 MAR	16.000	.560			.660	.900
1991 APR	66.000	1.100			1.500	.900
1991 MAY	12.000	.340 <T			.320 <T	.270 <T
1991 JUN	16.000	.390 <T			.320 <T	.210 <T
1991 JUL	11.000	.190 <T			.160 <T	.140 <T
1991 AUG	27.000	.570			.270 <T	.310 <T
1991 SEP	19.000	.220 <T			.170 <T	.110 <T
1991 OCT	5.700	.680			.570	.470 <T
1991 NOV	8.500	.610			.540	.160 <T
1992 FEB	2.500	.950			1.100	.630
1992 APR	7.400	.790				
1992 JUN	27.000	1.000				
1992 AUG	10.000	1.000				
1992 NOV	12.000	3.900	2.600	3.600		
1992 DEC	6.500	1.100	1.500	.800		
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JAN	.500 <T	1.400			1.400	1.600
1991 FEB	.730	1.000			.990	.990
1991 MAR	.320 <T	.930			1.100	1.000
1991 APR	.160 <T	1.600			1.700	1.500
1991 MAY	1.100	1.500			1.400	1.500
1991 JUN	.430 <T	.920			.950	.920
1991 JUL	.670	1.100			1.300	1.200
1991 AUG	.390 <T	.890			1.100	1.100
1991 SEP	.420 <T	.950			.920	.950
1991 OCT	.470 <T	.630			.660	.690
1991 NOV	.480 <T	.680			.680	.700
1992 FEB	.500 <T	.570			.490 <T	.610
1992 APR	1.300	1.500				
1992 JUN	.590	1.000				
1992 AUG	1.700 <T	2.500				
1992 NOV	.190 <T	.990	1.100	1.100		
1992 DEC	.650	.890	.970	.910		

METALS

NICKEL (UG/L)   METALS

DET'N LIMIT = 0.20   GUIDELINE = 350 (D3)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	1.400 <T	.710 <T			.940 <T	1.100 <T
1991 FEB	1.200 <T	.880 <T			.990 <T	1.000 <T
1991 MAR	.850 <T	BDL			.350 <T	BDL
1991 APR	2.200	BDL			.300 <T	.420 <T
1991 MAY	.890 <T	BDL			BDL	BDL
1991 JUN	1.600 <T	.250 <T			.600 <T	.490 <T
1991 JUL	2.500	2.300			2.200	1.700 <T
1991 AUG	1.400 <T	BDL			BDL	BDL
1991 SEP	.450 <T	BDL			BDL	BDL
1991 OCT	1.000 <T	.730 <T			.510 <T	.820 <T
1991 NOV	.590 <T	BDL			BDL	BDL
1992 FEB	1.600 <T	1.300 <T			1.200 <T	1.200 <T
1992 APR	3.700	2.700				
1992 JUN	2.700	1.200 <T				
1992 AUG	2.300	1.600 <T				
1992 NOV	2.000 <T	.680 <T	.550 <T	.770 <T		
1992 DEC	1.900 <T	1.300 <T	1.200 <T	1.100 <T		

LEAD (UG/L)

DET'N LIMIT = 0.05   GUIDELINE = 10 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	1.000	BDL			.280 <T	.980
1991 FEB	.300 <T	.140 <T			.290 <T	.360 <T
1991 MAR	1.200	BDL			.200 <T	1.100
1991 APR	3.500	.090 <T			.440 <T	2.400
1991 MAY	.810	BDL			.480 <T	1.800
1991 JUN	.780	BDL			.570	1.300
1991 JUL	.240 <T	BDL			.350 <T	1.200
1991 AUG	.850	BDL			.510	.570
1991 SEP	.530	BDL			.260 <T	.650
1991 OCT	.230 <T	BDL			.280 <T	.850
1991 NOV	.320 <T	BDL			.360 <T	1.800
1992 FEB	.400 <T	.060 <T			.420 <T	1.400
1992 APR	.340 <T	BDL				
1992 JUN	1.200	BDL				
1992 AUG	.330 <T	.160 <T				
1992 NOV	1.700	.070 <T	.190 <T	.360 <T		
1992 DEC	.670	BDL	.100 <T	.170 <T		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

ANTIMONY (UG/L) METALS

DET'N LIMIT = 0.05 GUIDELINE = 146 (D4)

	TREATMENT-PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	.330 <T	.530			.670	.580
1991 FEB	.400 <T	.460 <T			.460 <T	.440 <T
1991 MAR	.400 <T	.680			.660	.650
1991 APR	.220 <T	.560			.610	.670
1991 MAY	.410 <T	.410 <T			.400 <T	.450 <T
1991 JUN	.370 <T	.540			.410 <T	.540
1991 JUL	.570	.530			.630	.660
1991 AUG	.500 <T	.640			.680	.530
1991 SEP	.400 <T	.420 <T			.360 <T	.340 <T
1991 OCT	.480 <T	.380 <T			.400 <T	.360 <T
1991 NOV	.490 <T	.440 <T			.440 <T	.480 <T
1992 FEB	.520	.410 <T			.340 <T	.290 <T
1992 APR	.420 <T	.450 <T				
1992 JUN	.220 <T	.330 <T				
1992 AUG	.350 <T	.370 <T				
1992 NOV	.330 <T	.540	.580	.650		
1992 DEC	.390 <T	.390 <T	.380 <T	.420 <T		

SELENIUM (UG/L)

DET'N LIMIT = 1.00 GUIDELINE = 10 (A1)

	TREATMENT-PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	BDL			BDL	BDL
1991 FEB	BDL	BDL			BDL	1.400 <T
1991 MAR	BDL	1.500 <T			2.400 <T	-2.700 <T
1991 APR	BDL	BDL			BDL	BDL
1991 MAY	BDL	1.100 <T			BDL	1.200 <T
1991 JUN	BDL	1.100 <T			BDL	1.500 <T
1991 JUL	BDL	1.400 <T			1.200 <T	3.200 <T
1991 AUG	BDL	BDL			BDL	BDL
1991 SEP	BDL	1.500 <T			1.900 <T	2.000 <T
1991 OCT	1.300 <T	1.500 <T			BDL	1.300 <T
1991 NOV	BDL	BDL			BDL	BDL
1992 FEB	BDL	1.600 <T			3.400 <T	1.600 <T
1992 APR	BDL	BDL				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	2.900 <T	1.400 <T	1.500 <T	1.500 <T		
1992 DEC	BDL	BDL	BDL	BDL		

METALS

STRONTIUM (UG/L)

DET'N LIMIT = 0.10 GUIDELINE = N/A

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	190.000	170.000			180.000	180.000
1991 FEB	130.000	130.000			130.000	130.000
1991 MAR	190.000	170.000			170.000	170.000
1991 APR	220.000	270.000			280.000	260.000
1991 MAY	260.000	250.000			240.000	270.000
1991 JUN	130.000	130.000			120.000	120.000
1991 JUL	120.000	120.000			160.000	150.000
1991 AUG	130.000	130.000			140.000	140.000
1991 SEP	130.000	130.000			150.000	140.000
1991 OCT	110.000	110.000			110.000	110.000
1991 NOV	120.000	120.000			120.000	120.000
1992 FEB	150.000	160.000			150.000	150.000
1992 APR	340.000	270.000				
1992 JUN	160.000	130.000				
1992 AUG	360.000	390.000				
1992 NOV	130.000	150.000	150.000	150.000		
1992 DEC	170.000	170.000	170.000	180.000		

TITANIUM (UG/L)

DET'N LIMIT = 0.50 GUIDELINE = N/A

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	8.400	5.600			5.400	5.700
1991 FEB	5.700	3.800 <T			4.000 <T	3.800 <T
1991 MAR	13.000	8.300			8.600	8.200
1991 APR	14.000	9.300			9.000	8.900
1991 MAY	3.700 <T	1.600 <T			1.900 <T	1.700 <T
1991 JUN	3.800 <T	1.500 <T			1.500 <T	1.400 <T
1991 JUL	5.500	2.200 <T			2.000 <T	2.500 <T
1991 AUG	4.100 <T	1.500 <T			.930 <T	.870 <T
1991 SEP	2.900 <T	.730 <T			.810 <T	.680 <T
1991 OCT	2.400 <T	.950 <T			.970 <T	1.100 <T
1991 NOV	2.300 <T	1.100 <T			1.200 <T	1.200 <T
1992 FEB	1.500 <T	.830 <T			1.100 <T	.680 <T
1992 APR	8.300	5.400				
1992 JUN	4.000 <T	1.700 <T				
1992 AUG	12.000	8.300				
1992 NOV	3.900 <T	2.000 <T	2.000 <T	2.200 <T		
1992 DEC	3.300 <T	1.900 <T	1.900 <T	1.900 <T		

THALLIUM (UG/L)

DET'N LIMIT = 0.05 GUIDELINE = 13 (D4)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
62 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

URANIUM (UG/L)

GUIDELINE = 100 (A1) DET'N LIMIT = 0.05

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	1.300	.390 <T			.530	.470 <T
1991 FEB	.750	.240 <T			.230 <T	.240 <T
1991 MAR	1.400	.890			.850	.820
1991 APR	1.000	.840			1.200	.840
1991 MAY	.950	.200 <T			.190 <T	.170 <T
1991 JUN	.520	.090 <T			.060 <T	.080 <T
1991 JUL	.380 <T	BDL			BDL	BDL
1991 AUG	.410 <T	BDL			BDL	BDL
1991 SEP	.260 <T	BDL			BDL	BDL
1991 OCT	.240 <T	.070 <T			BDL	.060 <T
1991 NOV	.240 <T	BDL			BDL	BDL
1992 FEB	.290 <T	.250 <T			.190 <T	.230 <T
1992 APR	1.400	.580				
1992 JUN	.530	BDL				
1992 AUG	1.100	.980				
1992 NOV	.590	.070 <T	.080 <T	.100 <T		
1992 DEC	1.100	.650	.570	.550		

VANADIUM (UG/L)

GUIDELINE = N/A DET'N LIMIT = 0.05

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	.990	.140 <T			.200 <T	.160 <T
1991 FEB	.370 <T	.170 <T			.200 <T	.180 <T
1991 MAR	1.000	.250 <T			.210 <T	.180 <T
1991 APR	2.300	.300 <T			.490 <T	.390 <T
1991 MAY	.840	.440 <T			.410 <T	.440 <T
1991 JUN	1.100	.310 <T			.400 <T	.350 <T
1991 JUL	.670	.180 <T			.430 <T	.200 <T
1991 AUG	1.200	.210 <T			.210 <T	.230 <T
1991 SEP	.750	.160 <T			.330 <T	.290 <T
1991 OCT	.280 <T	.080 <T			.180 <T	.100 <T
1991 NOV	.140 <T	BDL			BDL	.060 <T
1992 FEB	BDL	BDL			BDL	BDL
1992 APR	.420 <T	.210 <T				
1992 JUN	.830	.080 <T				
1992 AUG	1.100	.860				
1992 NOV	1.300	.080 <T	.110 <T	.120 <T		
1992 DEC	.820	.370 <T	.330 <T	.340 <T		

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
ZINC (UG/L)	METALS		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)	
1991 JAN	5.800	1.600 <T	.	.	2.200	3.000
1991 FEB	2.800	2.800	.	.	2.500	2.500
1991 MAR	8.200	3.000	.	.	3.300	4.100
1991 APR	16.000	3.300	.	.	3.600	5.400
1991 MAY	8.400	1.300 <T	.	.	2.300	2.200
1991 JUN	5.900	2.700	.	.	5.900	5.300
1991 JUL	3.900	3.500	.	.	6.400	4.900
1991 AUG	5.400	2.300	.	.	2.300	2.600
1991 SEP	3.200	.350 <T	.	.	.700 <T	1.800 <T
1991 OCT	1.800 <T	.750 <T	.	.	.890 <T	2.200
1991 NOV	3.000	2.300	.	.	1.800 <T	4.200
1992 FEB	4.300	2.000 <T	.	.	1.200 <T	3.700
1992 APR	2.700	1.400 <T	.	.	.	.
1992 JUN	8.400	2.100	.	.	.	.
1992 AUG	4.500	2.600	.	.	.	.
1992 NOV	7.300	.950 <T	6.600	27.000	.	.
1992 DEC	4.400	2.100	4.100	7.300	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
CHLOROAROMATICS						
HEXACHLOROBUTADIENE (NG/L)	BDL	BDL	DET'N LIMIT = 1.000		GUIDELINE = 450 (D4)	BDL
32 SAMPLES						
123-TRICHLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 5.000		GUIDELINE = N/A	BDL
32 SAMPLES						
1234-TETCLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 1.000		GUIDELINE = N/A	BDL
32 SAMPLES						
1235-TETCLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 1.000		GUIDELINE = N/A	BDL
32 SAMPLES						
124-TRICHLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 5.000		GUIDELINE = 10000 (I)	BDL
32 SAMPLES						
1245-TETCLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 1.000		GUIDELINE = 38000 (D4)	BDL
32 SAMPLES						
135-TRICHLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 5.000		GUIDELINE = N/A	BDL
32 SAMPLES						
HEXACHLOROBENZENE (NG/L)	BDL	BDL	DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)	BDL
32 SAMPLES						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING

CHLOROAROMATICS

HEXACHLOROETHANE (NG/L) DET'N LIMIT = 1.000 GUIDELINE = 1900 (D4)

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
1991 JAN	BDL	BDL			BDL	
1991 FEB	BDL	5.000 <T			!IR	
1991 MAR	BDL	BDL			BDL	
1991 APR	BDL	2.000 <T			5.000 <T	
1991 MAY	!RE	!QU			!QU	
1991 JUN	BDL	BDL			BDL	
1991 JUL	!AW	!AW			!AW	
1991 AUG	!AW	!AW			!AW	
1991 SEP	!AW	!AW			!AW	
1991 OCT	BDL	BDL			!AW	
1991 NOV	BDL	3.000 <T			2.000 <T	
1992 FEB	BDL	2.000 <T			BDL	
1992 APR	BDL	BDL			1.000 <T	
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	!PE	!PE	!PE			
1992 DEC	BDL	3.000 <T	2.000 <T			

OCTACHLOROSTYRENE (NG/L) DET'N LIMIT = 1.000 GUIDELINE = N/A

	RAW	TREATED	SOUTH ST FREE FLOW	WEST RIVER FREE FLOW
	BDL	BDL	BDL	BDL
32 SAMPLES				

PENTACHLOROBENZENE (NG/L) DET'N LIMIT = 1.000 GUIDELINE = 74000 (D4)

	RAW	TREATED	SOUTH ST FREE FLOW	WEST RIVER FREE FLOW
	BDL	BDL	BDL	BDL
32 SAMPLES				

236-TRICHLOROTOLUENE (NG/L) DET'N LIMIT = 5.000 GUIDELINE = N/A

	RAW	TREATED	SOUTH ST FREE FLOW	WEST RIVER FREE FLOW
	BDL	BDL	BDL	BDL
32 SAMPLES				

245-TRICHLOROTOLUENE (NG/L) DET'N LIMIT = 5.000 GUIDELINE = N/A

	RAW	TREATED	SOUTH ST FREE FLOW	WEST RIVER FREE FLOW
	BDL	BDL	BDL	BDL
32 SAMPLES				

26A-TRICHLOROTOLUENE (NG/L) DET'N LIMIT = 5.000 GUIDELINE = N/A

	RAW	TREATED	SOUTH ST FREE FLOW	WEST RIVER FREE FLOW
	BDL	BDL	BDL	BDL
32 SAMPLES				

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

CHLOROPHENOLS (NG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
234-TRICHLOROPHENOL (NG/L)	BDL		DET'N LIMIT = 100.0		GUIDELINE = N/A	
9 SAMPLES		BDL				
2345-TETCHLOROPHENOL (NG/L)	BDL		DET'N LIMIT = 20.0		GUIDELINE = N/A	
9 SAMPLES		BDL				
2356-TETCHLOROPHENOL (NG/L)	BDL		DET'N LIMIT = 10.0		GUIDELINE = N/A	
9 SAMPLES		BDL				
245-TRICHLOROPHENOL (NG/L)	BOL		DET'N LIMIT = 100.0		GUIDELINE = 2600000 (D4)	
9 SAMPLES		BOL				
246-TRICHLOROPHENOL (NG/L)	BOL		DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)	
9 SAMPLES		BDL				
PENTACHLOROPHENOL (NG/L)	BDL		DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)	
8 SAMPLES		BOL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING

PESTICIDES AND PCB

ALDRIN (NG/L))

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
32 SAMPLES	BDL	BDL	DET'N LIMIT = 1.000	.	BDL — GUIDELINE = 700 (A1)	.

ALPHA BHC (NG/L))   DET'N LIMIT = 1.000 (SOUTH ST FREE FLOW)   GUIDELINE = 700 (G) (WEST RIVER FREE FLOW)

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
1991 JAN	2.000 <T	1.000 <T	.	.	1.000 <T	.
1991 FEB	2.000 <T	1.000 <T	.	.	!IR	.
1991 MAR	1.000 <T	2.000 <T	.	.	BDL	.
1991 APR	BDL	BDL	.	.	BDL	.
1991 MAY	!RE	!QU	.	.	!QU	.
1991 JUN	BDL	BDL	.	.	BDL	.
1991 JUL	!AW	!AW	.	.	!AW	.
1991 AUG	!AW	!AW	.	.	!AW	.
1991 SEP	!AW	!AW	.	.	!AW	.
1991 OCT	1.000 <T	BDL	.	.	BDL	.
1991 NOV	1.000 <T	1.000 <T	.	.	2.000 <T	.
1992 FEB	BDL	BDL	.	.	BDL	.
1992 APR	BDL	BDL	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	BDL	BDL	.	.	.	.
1992 NOV	!PE	!PE	!PE	.	.	.
1992 DEC	1.000 <T	1.000 <T	1.000 <T	.	.	.

BETA BHC (NG/L))

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
32 SAMPLES	BDL	BDL	DET'N LIMIT = 1.00	.	BDL — GUIDELINE = 300 (G)	.

LINDANE (GAMMA BHC) (NG/L))   DET'N LIMIT = 1.000 (SOUTH ST FREE FLOW)   GUIDELINE = 4000 (A1) (WEST RIVER FREE FLOW)

	RAW	TREATED	SOUTH ST FREE FLOW	SOUTH ST STANDING	WEST RIVER FREE FLOW	WEST RIVER STANDING
1991 JAN	BDL	BDL	.	.	BDL	.
1991 FEB	BDL	BDL	.	.	!IR	.
1991 MAR	1.000 <T	1.000 <T	.	.	BDL	.
1991 APR	BDL	BDL	.	.	BDL	.
1991 MAY	!RE	!QU	.	.	!QU	.
1991 JUN	BDL	BDL	.	.	BDL	.
1991 JUL	!AW	!AW	.	.	!AW	.
1991 AUG	!AW	!AW	.	.	!AW	.
1991 SEP	!AW	!AW	.	.	!AW	.
1991 OCT	BDL	BDL	.	.	BDL	.
1991 NOV	BDL	BDL	.	.	BDL	.
1992 FEB	1.000 <T	BDL	.	.	BDL	.
1992 APR	BDL	BDL	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	BDL	BDL	.	.	.	.
1992 NOV	!PE	!PE	!PE	.	.	.
1992 DEC	BDL	BDL	BDL	.	.	.

PESTICIDES AND PCB

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
ALPHA CHLORDANE (NG/L)			DET'N LIMIT = 2.000		GUIDELINE = 7000 (A1)	
32 SAMPLES	BDL	BDL	BDL		BDL	
GAMMA CHLORDANE (NG/L)			DET'N LIMIT = 2.00		GUIDELINE = 7000 (A1)	
32 SAMPLES	BDL	BDL	BDL		BDL	
DIELDRIN (NG/L)			DET'N LIMIT = 2.00		GUIDELINE = 700 (A1)	
32 SAMPLES	BDL	BDL	BDL		BDL	
METHOXYCHLOR (NG/L)			DET'N LIMIT = 5.0		GUIDELINE = 900000 (A1)	
32 SAMPLES	BDL	BDL	BDL		BDL	
ENDOSULFAN 1 (NG/L)			DET'N LIMIT = 2.00		GUIDELINE = 74000 (O4)	
32 SAMPLES	BDL	BDL	BDL		BDL	
ENDOSULFAN II (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = 74000 (O4)	
32 SAMPLES	BDL	BDL	BDL		BDL	
ENDRIN (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = 1600 (O3)	
32 SAMPLES	BDL	BDL	BDL		BDL	
ENDOSULFAN SULPHATE (NG/L)			DET'N LIMIT = 5.00		GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL		BDL	
HEPTACHLOR EPOXIDE (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)	
21 SAMPLES	BDL	BDL	BDL		BDL	
HEPTACHLOR (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)	
32 SAMPLES	BDL	BDL	BDL		BDL	
MIREX (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL		BDL	
OXYCHLORDANE (NG/L)			DET'N LIMIT = 2.000		GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL		BDL	

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
PESTICIDES AND PCB						
O,P-DDT (NG/L >)			DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
32 SAMPLES	BDL	BDL	BDL	.	BDL	.
PCB (NG/L >)			DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)	
32 SAMPLES	BDL	BDL	BDL	.	BDL	.
P,P-DDD (NG/L >)			DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
32 SAMPLES	BDL	BDL	BDL	.	BDL	.
P,P-DDE (NG/L >)			DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)	
32 SAMPLES	BDL	BDL	BDL	.	BDL	.
P,P-DDT (NG/L >)			DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
32 SAMPLES	BDL	BDL	BDL	.	BDL	.
TOXAPHENE (NG/L >)			DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
24 SAMPLES	BDL	BDL	BDL	.	BDL	.
AMETRINE (NG/L >)			DET'N LIMIT = 50.0		GUIDELINE = 300000 (D3)	
28 SAMPLES	BDL	BDL	BDL	.		.
ATRAZINE (NG/L >)			DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)	
1991 JAN	410.000 <T	460.000 <T	.	.	.	.
1991 FEB	BDL	BDL	.	.	.	.
1991 MAR	100.000 <T	270.000 <T	.	.	.	.
1991 APR	200.000 <T	240.000 <T	.	.	.	.
1991 MAY	IIS	BDL	.	.	.	.
1991 JUN		!AW	.	.	.	.
1991 JUL	!AW	!AW	.	.	.	.
1991 AUG	260.000 <T	BDL	.	.	.	.
1991 SEP	90.000 <T	BDL	.	.	.	.
1991 OCT	BDL	BDL	.	.	.	.
1991 NOV	BDL	BDL	.	.	.	.
1992 FEB	BDL	BDL	.	.	.	.
1992 APR	170.000 <T	140.000 <T	.	.	.	.
1992 JUN	130.000 <T	70.000 <T	.	.	.	.
1992 AUG	1090.000		.	.	.	.
1992 NOV	130.000 <T	200.000 <T	.	.	.	.
1992 DEC	90.000 <T	120.000 <T	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
PESTICIDES AND PCB						
ATRATONE (NG/L)			DET'N LIMIT = 50.0		GUIDELINE = N/A	
28 SAMPLES	BDL	BDL				
CYANAZINE (BLADEX) (NG/L)			DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)	
28 SAMPLES	BDL	BDL				
DESETHYL ATRAZINE (NG/L)			DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)	
1991 JAN	BDL					
1991 FEB	BDL					
1991 MAR	BDL					
1991 APR	BDL	260.000 <T				
1991 MAY	!!S	BDL				
1991 JUN	.	!AW				
1991 JUL	!AW	!AW				
1991 AUG	BDL	BDL				
1991 SEP	BDL	BDL				
1991 OCT	BDL	BDL				
1991 NOV	BDL	BDL				
1992 FEB	BDL	BDL				
1992 APR	BDL	BDL				
1992 JUN	BDL					
1992 AUG	410.000 <T	BDL				
1992 NOV	BDL	BDL				
1992 DEC	BDL	BDL				
DESETHYL SIMAZINE (NG/L)			DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)	
28 SAMPLES	BDL	BDL				
PROMETONE (NG/L)			DET'N LIMIT = 50.000		GUIDELINE = 52500 (D3)	
28 SAMPLES	BDL	BDL				
PROPAZINE (NG/L)			DET'N LIMIT = 50.000		GUIDELINE = 700000 (D3)	
28 SAMPLES	BDL	BDL				
PROMETRYNE (NG/L)			DET'N LIMIT = 50.000		GUIDELINE = 1000 (A2)	
28 SAMPLES	BDL	BDL				
METRIBUZIN (SENCOR) (NG/L)			DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)	
28 SAMPLES	BDL	BDL				

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
SIMAZINE (NG/L)			DET'N LIMIT = 50.00		GUIDELINE = 10000 (A2)	
1991 JAN	BDL	BDL	.	.	.	.
1991 FEB	BDL	BDL	.	.	.	.
1991 MAR	BDL	BDL	.	.	.	.
1991 APR	BDL	BDL	.	.	.	.
1991 MAY	11S	11S	.	.	.	.
1991 JUN	.	IAW	.	.	.	.
1991 JUL	IAW	IAW	.	.	.	.
1991 AUG	BDL	BDL	.	.	.	.
1991 SEP	BDL	BDL	.	.	.	.
1991 OCT	BDL	BDL	.	.	.	.
1991 NOV	BDL	BDL	.	.	.	.
1992 FEB	BDL	BDL	.	.	.	.
1992 APR	BDL	BDL	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	50.000 <T	.	.	.	.	.
1992 NOV	BDL	BDL	.	.	.	.
1992 DEC	BDL	BDL	.	.	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
ALACHLOR (LASSO) (NG/L)			DET'N LIMIT = 500.0		GUIDELINE = 5000 (A2)	
28 SAMPLES	BDL	BDL	.	.	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
METOLACHLOR (NG/L)			DET'N LIMIT = 500.0		GUIDELINE = 50000 (A2)	
1991 JAN	BDL	BDL	.	.	.	.
1991 FEB	BDL	BDL	.	.	.	.
1991 MAR	BDL	BDL	.	.	.	.
1991 APR	BDL	BDL	.	.	.	.
1991 MAY	11S	BDL	.	.	.	.
1991 JUN	.	IAW	.	.	.	.
1991 JUL	IAW	IAW	.	.	.	.
1991 AUG	BDL	BDL	.	.	.	.
1991 SEP	BDL	BDL	.	.	.	.
1991 OCT	BDL	BDL	.	.	.	.
1991 NOV	BDL	BDL	.	.	.	.
1992 FEB	BDL	BDL	.	.	.	.
1992 APR	BDL	BDL	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	920.000 <T	.	.	.	.	.
1992 NOV	BDL	BDL	.	.	.	.
1992 DEC	BDL	BDL	.	.	.	.

PESTICIDES AND PCB

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

PESTICIDES AND PCB

HEXACLCYCLOPENTADIEN (NG/L)

DET'N LIMIT = 5.00   GUIDELINE = 206000 (D4)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	BDL			BDL	
1991 FEB	BDL	20.000 <T			!IR	
1991 MAR	BDL	BDL			50.000 <T	
1991 APR	BDL	74.000			66.000	
1991 MAY	!RE	!QU			!QU	
1991 JUN	BDL	47.000 <T			46.000 <T	
1991 JUL	!AW	!AW			!AW	
1991 AUG	!AW	!AW			!AW	
1991 SEP	!AW	!AW			!AW	
1991 OCT	BDL	12.000 <T			18.000 <T	
1991 NOV	BDL	17.000 <T			13.000 <T	
1992 FEB	BDL	10.000 <T			24.000 <T	
1992 APR	!QU	!QU				
1992 JUN	!QU	!QU				
1992 AUG	!QU	!QU				
1992 NOV	!PE	!PE	!PE			
1992 DEC	!QU	!QU	!QU			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
PHENOLICS (UG/L)	PHENOLICS		DET'N LIMIT =	0.2	GUIDELINE = N/A	
1991 JAN	.800 <T	1.000				
1991 FEB	.600 <T	BDL				
1991 MAR	.600 <T	.800 <T				
1991 APR	.400 <T	.600 <T				
1991 MAY	BDL	BDL				
1991 JUN	.800 <T	1.400				
1991 JUL	BDL	BDL				
1991 AUG	.400 <T	.400 <T				
1991 SEP	BDL	BDL				
1991 OCT	BDL	BDL				
1991 NOV	.400 <T	.800 <T				
1992 FEB	.400 <T	.600 <T				
1992 APR	1.800	1.600				
1992 JUN	BDL	.600 <T				
1992 AUG	BDL	.600 <T				
1992 NOV	.600 <T	BDL				
1992 DEC	.400 <T	BDL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
POLYAROMATIC HYDROCARBONS						
PHENANTHRENE (NG/L)		BDL	DET'N LIMIT = 10.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
ANTHRACENE (NG/L)		BDL	DET'N LIMIT = 1.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
FLUORANTHENE (NG/L)		BDL	DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)	
19 SAMPLES					BDL	
PYRENE (NG/L)		BDL	DET'N LIMIT = 20.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
BENZO(A)ANTHRACENE (NG/L)		BDL	DET'N LIMIT = 20.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
CHRYSENE (NG/L)		BDL	DET'N LIMIT = 50.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
DIMETH. BENZ(A)ANTHR (NG/L)		BDL	DET'N LIMIT = 5.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
BENZO(E) PYRENE (NG/L)		BDL	DET'N LIMIT = 50.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
BENZO(B) FLUORANTHEN (NG/L)		BDL	DET'N LIMIT = 10.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
PERYLENE (NG/L)		BDL	DET'N LIMIT = 10.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
BENZO(K) FLUORANTHEN (NG/L)		BDL	DET'N LIMIT = 1.0		GUIDELINE = N/A	
19 SAMPLES					BDL	
BENZO(A) PYRENE (NG/L)		BDL	DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)	
19 SAMPLES					BDL	

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
POLYAROMATIC HYDROCARBONS						
BENZO(G,H,I) PERYLEN (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	
19 SAMPLES	BDL	BDL			BDL	
DIBENZO(A,H) ANTHRAC (NG/L)			DET'N LIMIT = 10.0		GUIDELINE = N/A	
19 SAMPLES	BDL	BDL			BDL	
INDENO(1,2,3-C,D) PY (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	
19 SAMPLES	BDL	BDL			BDL	
BENZO(B) CHRYSENE (NG/L)			DET'N LIMIT = 2.0		GUIDELINE = N/A	
19 SAMPLES	BDL	BDL			BDL	
CORONENE (NG/L)			DET'N LIMIT = 10.0		GUIDELINE = N/A	
19 SAMPLES	BDL	BDL			BDL	

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
SPECIFIC PESTICIDES						
TOXAPHENE (NG/L)	BDL	BDL	DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
8 SAMPLES					BDL	
2,4,5-T (NG/L)	BDL	BDL	DET'N LIMIT = 50.0		GUIDELINE = 280000 (A1)	
9 SAMPLES						
2,4-D (NG/L)	BDL	BDL	DET'N LIMIT = 100.0		GUIDELINE = 100000 (A1)	
9 SAMPLES						
2,4-DB (NG/L)	BDL	BDL	DET'N LIMIT = 200.0		GUIDELINE = N/A	
9 SAMPLES						
2,4 D PROPIONIC ACID (NG/L)	BDL	BDL	DET'N LIMIT = 100.0		GUIDELINE = N/A	
9 SAMPLES						
DICAMBA (NG/L)	130.000 <T	120.000 <T	DET'N LIMIT = 50.0		GUIDELINE = 120000 (A1)	
1991 JUN	BDL	!LA				
1991 AUG	BDL	BDL				
1991 NOV	BDL	BDL				
1992 JUN	BDL	BDL				
1992 NOV	BDL	BDL				
2,4,5-TP (SILVEX) (NG/L)	BDL	BDL	DET'N LIMIT = 20.00		GUIDELINE = 10000 (A1)	
9 SAMPLES						
DIAZINON (NG/L)	BDL	BDL	DET'N LIMIT = 20.0		GUIDELINE = 20000 (A1)	
4 SAMPLES						
DICHLOROVOS (NG/L)	BDL	BDL	DET'N LIMIT = 20.0		GUIDELINE = N/A	
4 SAMPLES						
CHLORPYRIFOS (NG/L)	BDL	BDL	DET'N LIMIT = 20.0		GUIDELINE = N/A	
4 SAMPLES						
ETHION (NG/L)	BDL	BDL	DET'N LIMIT = 20.0		GUIDELINE = 35000 (G)	
4 SAMPLES						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
SPECIFIC PESTICIDES						
MALATHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 190000 (A1)	
4 SAMPLES	BDL	BDL		·		·
MEVINPHOS (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	·
4 SAMPLES	BDL	BDL		·		·
METHYL PARATHION (NG/L)			DET'N LIMIT = 50.0		GUIDELINE = 9000 (D3)	
4 SAMPLES	BDL	BDL		·		·
METHYLTRITHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	
4 SAMPLES	BDL	BDL		·		·
PARATHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 50000 (A1)	
4 SAMPLES	BDL	BDL	·	·		·
PHORATE (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 2000 (A2)	
4 SAMPLES	BDL	BDL		·		·
RELDAN (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	
4 SAMPLES	BDL	BDL		·		·
RONNEL (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A	
4 SAMPLES	BDL	BDL		·		·
CARBOFURAN (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 90000 (A1)	
7 SAMPLES	BDL	BDL		·		·
CHLORPROPHAM (CIPC) (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 350000 (G)	
7 SAMPLES	BDL	BDL		·		·
DIALLATE (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		·		·
EPTAM (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		·		·

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
SPECIFIC PESTICIDES						
IPC (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL	BDL				
PROPOXUR (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 140000 (D3)	
7 SAMPLES	BDL	BDL				
CARBARYL (NG/L)			DET'N LIMIT = 200.0		GUIDELINE = 90000 (A1)	
7 SAMPLES	BDL	BDL				
BUTYLATE (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 245000 (D3)	
7 SAMPLES	BDL	BDL				

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

BENZENE (UG/L) VOLATILES

DET'N LIMIT = 0.05   GUIDELINE = 5 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	BDL			BDL	
1991 FEB	BDL	BDL			BDL	
1991 MAR	BDL	BDL			BDL	
1991 APR	BDL	BDL			BDL	
1991 MAY	BDL	BDL			BDL	
1991 JUN	BDL	BDL			BDL	
1991 JUL	BDL	BDL			BDL	
1991 AUG	BDL	BDL			BDL	
1991 SEP	BDL	BDL			BDL	
1991 OCT	BDL	BDL			BDL	
1991 NOV	BDL	BDL			BDL	
1992 FEB	.050 <T	.050 <T			.050 <T	
1992 APR	BDL	BDL				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	BDL			

TOLUENE (UG/L)

DET'N LIMIT = 0.05   GUIDELINE = 24 (A5)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	.050 <T			.100 <T	
1991 FEB	.100 <T	.150 <T			.150 <T	
1991 MAR	BDL	.100 <T			.100 <T	
1991 APR	BDL	BDL			BDL	
1991 MAY	BDL	.050 <T			BDL	
1991 JUN	BDL	.050 <T			BDL	
1991 JUL	BDL	BDL			BDL	
1991 AUG	BDL	.050 <T			BDL	
1991 SEP	BDL	BDL			BDL	
1991 OCT	BDL	.050 <T			.050 <T	
1991 NOV	.050 <T	.150 <T			.100 <T	
1992 FEB	BDL	.100 <T			.100 <T	
1992 APR	BDL	.050 <T				
1992 JUN	BDL	.050 <T				
1992 AUG	BDL	BDL				
1992 NOV	BDL	.050 <T	.050 <T			
1992 DEC	BDL	.050 <T	.050 <T			

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING

ETHYLBENZENE (UG/L   VOLATILES)   DET'N LIMIT = 0.05   GUIDELINE = 2.4 (A3)

	RAW	TREATED	S.ST FREE	S.ST STAND	W.RIVER FREE	W.RIVER STAND
1991 JAN	BDL	.150 <T			BDL	
1991 FEB	.050 <T	.100 <T			.050 <T	
1991 MAR	BDL	.100 <T			.100 <T	
1991 APR	BDL	.050 <T			.050 <T	
1991 MAY	BDL	.200 <T			BDL	
1991 JUN	BDL	.200 <T			.050 <T	
1991 JUL	BDL	.200 <T			.050 <T	
1991 AUG	BDL	.200 <T			.100 <T	
1991 SEP	BDL	.100 <T			.100 <T	
1991 OCT	BDL	BDL			.050 <T	
1991 NOV	BDL	.050 <T			.100 <T	
1992 FEB	BDL	.100 <T			.050 <T	
1992 APR	BDL	.100 <T				
1992 JUN	BDL	.100 <T				
1992 AUG	BDL	.050 <T				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	.050 <T			

P-XYLENE (UG/L   )   DET'N LIMIT = 0.10   GUIDELINE = 300 (A3*)

48 SAMPLES

	RAW	TREATED	S.ST FREE	W.RIVER FREE
	BDL	BDL	BDL	BDL

M-XYLENE (UG/L   )   DET'N LIMIT = 0.10   GUIDELINE = 300 (A3*)

	RAW	TREATED	S.ST FREE	S.ST STAND	W.RIVER FREE	W.RIVER STAND
1991 JAN	BDL	.100 <T			.100 <T	
1991 FEB	BDL	.100 <T			.100 <T	
1991 MAR	BDL	.100 <T			.200 <T	
1991 APR	BDL	.100 <T			BDL	
1991 MAY	BDL	.400 <T			BDL	
1991 JUN	BDL	.300 <T			BDL	
1991 JUL	BDL	BDL			BDL	
1991 AUG	BDL	.200 <T			BDL	
1991 SEP	BDL	.100 <T			BDL	
1991 OCT	BDL	BDL			BDL	
1991 NOV	BDL	BDL			BDL	
1992 FEB	BDL	BDL				
1992 APR	BDL	BDL				
1992 JUN	BDL	.100 <T				
1992 AUG	BDL	BDL				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	BDL			

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
O-XYLENE (UG/L) VOLATILES			DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)	
1991 JAN	BDL	BDL			.050 <T	
1991 FEB	BDL	.050 <T			BDL	
1991 MAR	BDL	.050 <T			.050 <T	
1991 APR	BDL	BDL			BDL	
1991 MAY	BDL	.100 <T			.050 <T	
1991 JUN	BDL	.100 <T			.100 <T	
1991 JUL	BDL	BDL			BDL	
1991 AUG	BDL	.100 <T			BDL	
1991 SEP	BDL	BDL			BDL	
1991 OCT	BDL	BDL			BDL	
1991 NOV	BDL	BDL			BDL	
1992 FEB	BDL	BDL			BDL	
1992 APR	BDL	.050 <T				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	BDL			
STYRENE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)	
1991 JAN	BDL	.150 <T			BDL	
1991 FEB	.050 <T	BDL			.100 <T	
1991 MAR	BDL	.100 <T			.150 <T	
1991 APR	BDL	.050 <T			.100 <T	
1991 MAY	BDL	BDL			.050 <T	
1991 JUN	BDL	BDL			BDL	
1991 JUL	BDL	BDL			.150 <T	
1991 AUG	BDL	BDL			.150 <T	
1991 SEP	BDL	BDL			.200 <T	
1991 OCT	BDL	BDL			.050 <T	
1991 NOV	BDL	BDL			.200 <T	
1992 FEB	.100 <T	.100 <T			.150 <T	
1992 APR	BDL	BDL				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL	BDL			
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	.100 <T			
48 SAMPLES	BDL	BDL				
1,1-DICHLOROETHYLENE (UG/L))			DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)	
48 SAMPLES	BDL	BDL	BDL			
METHYLENE CHLORIDE (UG/L))			DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)	
48 SAMPLES	BDL	BDL	BDL		BDL	

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
VOLATILES						
T12-DICHLOROETHYLENE (UG/L)	>		DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)	
48 SAMPLES	BDL	BDL	BDL		BDL	
1,1-DICHLOROETHANE (UG/L)	>		DET'N LIMIT = 0.100		GUIDELINE = N/A	
48 SAMPLES	BDL	BDL	BDL		BDL	
CHLOROFORM (UG/L)	>		DET'N LIMIT = 0.10		GUIDELINE = 350. (A1+)	
1991 JAN	BDL	23.700			19.700	
1991 FEB	BDL	27.000			13.200	
1991 MAR	BDL	41.400			25.900	
1991 APR	BDL	48.300			39.600	
1991 MAY	BDL	34.000			20.200	
1991 JUN	BDL	24.900			16.700	
1991 JUL	BDL	24.700			11.000	
1991 AUG	BDL	22.300			10.700	
1991 SEP	BDL	17.100			9.600	
1991 OCT	BDL	16.200			10.400	
1991 NOV	BDL	13.600			8.100	
1992 FEB	BDL	11.700			8.900	
1992 APR	BDL	29.200				
1992 JUN	BDL	20.600				
1992 AUG	BDL	42.400				
1992 NOV	BDL	21.200	20.600			
1992 DEC	BDL	47.000	26.200			
111,TRICHLOROETHANE (UG/L)	>		DET'N LIMIT = 0.02		GUIDELINE = 200 (D1)	
1991 JAN	BDL	.040 <T			BDL	
1991 FEB	BDL	.060 <T			.060 <T	
1991 MAR	.060 <T	.060 <T			.060 <T	
1991 APR	BDL	.060 <T			.040 <T	
1991 MAY	BDL	.040 <T			BDL	
1991 JUN	BDL	BDL			BDL	
1991 JUL	BDL	BDL			BDL	
1991 AUG	BDL	BDL			BDL	
1991 SEP	BDL	BDL			BDL	
1991 OCT	BDL	BDL			.040 <T	
1991 NOV	BDL	.040 <T			BDL	
1992 FEB	BDL	BDL			BDL	
1992 APR	BDL	BDL				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	BDL			

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
VOLATILES						
1,2 DICHLOROETHANE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)	
48 SAMPLES	BDL	BDL	BDL	.	BDL	.
CARBON TETRACHLORIDE (UG/L) >			DET'N LIMIT = 0.20		GUIDELINE = 5 (A1)	
48 SAMPLES	BDL	BDL	BDL	.	BDL	.
1,2-DICHLOROPROPANE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 5 (D1)	
48 SAMPLES	BDL	BDL	BDL	.	BDL	.
TRICHLOROETHYLENE (UG/L) >			DET'N LIMIT = 0.10		GUIDELINE = 50 (A1)	
48 SAMPLES	BDL	BDL	BDL	.	BDL	.
DICHLOROBROMOMETHANE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	10.150	.	.	5.950	.
1991 FEB	BDL	14.700	.	.	6.000	.
1991 MAR	BDL	13.700	.	.	7.800	.
1991 APR	BDL	15.700	.	.	11.050	.
1991 MAY	BDL	17.400	.	.	11.400	.
1991 JUN	BDL	13.200	.	.	10.100	.
1991 JUL	BDL	13.250	.	.	8.750	.
1991 AUG	BDL	13.300	.	.	7.800	.
1991 SEP	BDL	11.700	.	.	7.800	.
1991 OCT	BDL	9.300	.	.	5.100	.
1991 NOV	BDL	8.800	.	.	4.550	.
1992 FEB	BDL	10.900	.	.	5.450	.
1992 APR	BDL	15.300	.	.	.	.
1992 JUN	BDL	14.150	.	.	.	.
1992 AUG	BDL	21.400	.	.	.	.
1992 NOV	BDL	8.150	5.800	.	.	.
1992 DEC	BDL	16.250	8.150	.	.	.
112-TRICHLOROETHANE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 0.6 (D4)	
48 SAMPLES	BDL	BDL	BDL	.	BDL	.

VOLATILES

CHLORODIBROMOMETHANE (UG/L)   DET'N LIMIT = 0.10   GUIDELINE = 350 (A1+)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	2.000	.	.	1.500	.
1991 FEB	BDL	4.900	.	.	2.500	.
1991 MAR	BDL	3.000	.	.	2.000	.
1991 APR	BDL	3.400	.	.	2.200	.
1991 MAY	BDL	5.700	.	.	4.000	.
1991 JUN	BDL	5.600	.	.	4.400	.
1991 JUL	BDL	6.200	.	.	4.600	.
1991 AUG	BDL	6.700	.	.	4.100	.
1991 SEP	BDL	6.600	.	.	4.700	.
1991 OCT	BDL	3.800	.	.	1.900	.
1991 NOV	BDL	3.300	.	.	1.800	.
1992 FEB	BDL	5.800	.	.	2.900	.
1992 APR	BDL	5.300	.	.	.	.
1992 JUN	BDL	7.300	.	.	.	.
1992 AUG	BDL	7.200	.	.	.	.
1992 NOV	BDL	1.300	1.100	.	.	.
1992 DEC	BDL	2.900	1.700	.	.	.

TETRACHLOROETHYLENE (UG/L)   DET'N LIMIT = 0.05   GUIDELINE = 65 (A5)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
1991 JAN	BDL	BDL	.	.	BDL	.
1991 FEB	BDL	.050 <T	.	.	BDL	.
1991 MAR	BDL	.050 <T	.	.	BDL	.
1991 APR	BDL	.100 <T	.	.	.050 <T	.
1991 MAY	BDL	BDL	.	.	BDL	.
1991 JUN	BDL	BDL	.	.	BDL	.
1991 JUL	BDL	.050 <T	.	.	.050 <T	.
1991 AUG	BDL	.050 <T	.	.	.050 <T	.
1991 SEP	BDL	BDL	.	.	BDL	.
1991 OCT	BDL	BDL	.	.	BDL	.
1991 NOV	BDL	BDL	.	.	BDL	.
1992 FEB	BDL	BDL	.	.	BDL	.
1992 APR	BDL	.050 <T	.	.	.	.
1992 JUN	BDL	BDL	.	.	.	.
1992 AUG	BDL	BDL	.	.	.	.
1992 NOV	BDL	BDL	BDL	.	.	.
1992 DEC	BDL	BDL	BDL	.	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
VOLATILES						
BROMOFORM (UG/L)			DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	BDL			BDL	
1991 FEB	BDL	.400 <T			.200 <T	
1991 MAR	BDL	BDL			BDL	
1991 APR	BDL	.200 <T			BDL	
1991 MAY	BDL	.400 <T			BDL	
1991 JUN	BDL	BDL			BDL	
1991 JUL	BDL	.600 <T			.800 <T	
1991 AUG	BDL	.800 <T			.600 <T	
1991 SEP	BDL	1.000 <T			.800 <T	
1991 OCT	BDL	BDL			BDL	
1991 NOV	BDL	BDL			BDL	
1992 FEB	BDL	BDL			BDL	
1992 APR	BDL	.600 <T				
1992 JUN	BDL	BDL				
1992 AUG	BDL	BDL				
1992 NOV	BDL	BDL	BDL			
1992 DEC	BDL	BDL	BDL			
1122-TETCHLOROETHANE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 0.17 (D4)	
48 SAMPLES	BDL	BDL	BDL		BDL	
VINYL CHLORIDE (UG/L) >			DET'N LIMIT = 0.100		GUIDELINE = 2 (D1)	
15 SAMPLES	BDL	BDL	BDL		BDL	
C12-DICHLOROETHYLENE (UG/L) >			DET'N LIMIT = 0.100		GUIDELINE = 70 (D1)	
15 SAMPLES	BDL	BDL	BDL		BDL	
CHLOROBENZENE (UG/L) >			DET'N LIMIT = 0.10		GUIDELINE = 1510 (D3)	
48 SAMPLES	BDL	BDL	BDL		BDL	
1,4-DICHLOROBENZENE (UG/L) >			DET'N LIMIT = 0.10		GUIDELINE = 5 (A1)	
48 SAMPLES	BDL	BDL	BDL		BDL	
1,3-DICHLOROBENZENE (UG/L) >			DET'N LIMIT = 0.10		GUIDELINE = 3750 (D3)	
48 SAMPLES	BDL	BDL	BDL		BDL	
1,2-DICHLOROBENZENE (UG/L) >			DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)	
48 SAMPLES	BDL	BDL	BDL		BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 BELLE RIVER WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
ETHYLENE DIBROMIDE (UG/L)	BDL	BDL				
48 SAMPLES	BDL	BDL	BDL		BDL	BDL
			DET'N LIMIT = 0.05		GUIDELINE = 50 (O1)	
TOTL TRIHALOMETHANES (UG/L)	BDL	BDL	BDL			
			DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)	
1991 JAN	BDL	35.900	.	.	27.150	.
1991 FEB	BDL	47.050	.	.	22.050	.
1991 MAR	BDL	58.050	.	.	35.650	.
1991 APR	BDL	67.550	.	.	52.800	.
1991 MAY	BDL	57.500	.	.	35.600	.
1991 JUN	BDL	43.700	.	.	31.200	.
1991 JUL	BDL	44.750	.	.	25.150	.
1991 AUG	BDL	43.100	.	.	23.200	.
1991 SEP	BDL	36.300	.	.	22.800	.
1991 OCT	BDL	29.300	.	.	17.400	.
1991 NOV	BDL	25.700	.	.	14.450	.
1992 FEB	BDL	28.400	.	.	17.250	.
1992 APR	BDL	49.800	.	.	.	.
1992 JUN	BDL	42.650	.	.	.	.
1992 AUG	BDL	71.000	.	.	.	.
1992 NOV	BDL	30.650	27.500	.	.	.
1992 DEC	BDL	66.150	36.050	.	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SOUTH ST FREE FLOW	DIST. SYSTEM SOUTH ST STANDING	DIST. SYSTEM WEST RIVER FREE FLOW	DIST. SYSTEM WEST RIVER STANDING
RADIONUCLIDES						
COBALT 60 (BQ/L))			DET'N LIMIT = 0.70		GUIDELINE = N/A	
6 SAMPLES	BDL	BDL				
CESIUM 134 (BQ/L))			DET'N LIMIT = 0.70		GUIDELINE = N/A	
6 SAMPLES	BDL	BDL				
CESIUM 137 (BQ/L))			DET'N LIMIT = 0.70		GUIDELINE = 50 (A1)	
6 SAMPLES	BDL	BDL				
GROSS ALPHA COUNT (BQ/L))			DET'N LIMIT = 0.04		GUIDELINE = 0.55 (D1)	
1991 FEB	BDL	BDL				
1991 SEP	.040	.040				
1992 APR	.060	.060				
GROSS BETA COUNT (BQ/L))			DET'N LIMIT = 0.04		GUIDELINE = N/A	
1991 FEB	.120	.100				
1991 SEP	.110	.070				
1992 APR	.090	.090				
TRITIUM (BQ/L))			DET'N LIMIT = 7.00		GUIDELINE = 40000 (A1)	
1991 FEB	BDL	9.000				
1991 SEP	BDL	BDL				
1992 APR	55.000	8.000				
IODINE 131 (BQ/L))			DET'N LIMIT = 0.70		GUIDELINE = 10 (A1)	
6 SAMPLES	BDL	BDL				

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	

BACTERIOLOGICAL

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0	(A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML	(A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A	
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML	(A1)

CHEMISTRY (FLD)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD PH	DMNSLESS	N/A	6.5-8.5	(A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0	(A3)
FIELD TURBIDITY	FTU	N/A	1.0	(A1)

CHEMISTRY (LAB)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
ALKALINITY	MG/L	0.20	30-500	(A4)
AMMONIUM TOTAL	MG/L	0.002	0.05	(F2)
CALCIUM	MG/L	0.20	100.0	(F2)
CHLORIDE	MG/L	0.20	250.0	(A3)
COLOUR	TCU	0.50	5.0	(A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0	(F2)
CYANIDE	MG/L	0.001	0.2	(A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0	(A3)
FLUORIDE	MG/L	0.01	1.5*	(A1)
HARDNESS	MG/L	0.50	80-100	(A4)
IONCAL	DMNSLESS	N/A	N/A	
LANGELIERS INDEX	DMNSLESS	N/A	N/A	
MAGNESIUM	MG/L	0.10	30.0	(F2)
NITRATES (TOTAL)	MG/L	0.005	10.0	(A1)
NITRITE	MG/L	0.001	1.0	(A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A	
PH	DMNSLESS	N/A	6.5-8.5	(A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A	
PHOSPHORUS TOTAL	MG/L	0.002	0.4	(F2)
POTASSIUM	MG/L	0.010	10.0	(F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0	(A3)
SODIUM	MG/L	0.20	200.0	(A4)
SULPHATE	MG/L	0.20	500.0	(A4)
TURBIDITY	FTU	0.05	1.0	(A1)

* The Maximum Acceptable Concentration (MAC) for naturally occurring fluoride in drinking water is 2.4 mg/L.

CHLOROAROMATICS

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A	
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A	
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A	
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000	(I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000	(D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A	
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A	
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A	
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A	
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10	(C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450	(D4)
HEXACHLOROETHANE	NG/L	1.0	1900	(D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A	
PENTACHLOROBENZENE	NG/L	1.0	74000	(D4)

CHLOROPHENOLS

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A	
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A	
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000	(D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000	(A1)
PENTACHLOROPHENOL	NG/L	10.0	60000	(A1)

METALS

ALUMINUM	UG/L	0.10	100	(A4)
ANTIMONY	UG/L	0.05	146	(D4)
ARSENIC	UG/L	0.10	25	(A1)
BARIUM	UG/L	0.05	1000	(A2)
BERYLLIUM	UG/L	0.05	6800	(D4)
BORON	UG/L	2.00	5000	(A1)
CADMIUM	UG/L	0.05	5	(A1)
CHROMIUM	UG/L	0.50	50	(A1)
COBALT	UG/L	0.02	N/A	
COPPER	UG/L	0.50	1000	(A3)
IRON	UG/L	6.00	300	(A3)
LEAD	UG/L	0.05	10	(A1)
MANGANESE	UG/L	0.05	50	(A3)
MERCURY	UG/L	0.02	1	(A1)
MOLYBDENUM	UG/L	0.05	N/A	
NICKEL	UG/L	0.20	350	(D3)
SELENIUM	UG/L	1.00	10	(A1)
SILVER	UG/L	0.05	N/A	
STRONTIUM	UG/L	0.10	N/A	
THALLIUM	UG/L	0.05	13	(D4)
TITANIUM	UG/L	0.50	N/A	
URANIUM	UG/L	0.05	100	(A1)
VANADIUM	UG/L	0.05	N/A	
ZINC	UG/L	0.20	5000	(A3)

POLYNUCLEAR AROMATIC HYDROCARBONS

ANTHRACENE	NG/L	1.0	N/A	
BENZO(A) ANTHRACENE	NG/L	20.0	N/A	
BENZO(A) PYRENE	NG/L	5.0	10	(A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A	
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A	
BENZO(E) PYRENE	NG/L	50.0	N/A	
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A	
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
CORONENE	NG/L	10.0	N/A	
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A	
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A	
FLUORANTHENE	NG/L	20.0	42000	(D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A	
PERYLENE	NG/L	10.0	N/A	
PHENANTHRENE	NG/L	10.0	N/A	
PYRENE	NG/L	20.0	N/A	

PESTICIDES & PCB

ALACHLOR (LASSO)	NG/L	500.0	5000	(A2)
ALDRIN	NG/L	1.0	700	(A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700	(G)
ALPHA CHLORDANE	NG/L	2.0	7000	(A1)
AMETRINE	NG/L	50.0	300000	(D3)
ATRATONE	NG/L	50.0	N/A	
ATRAZINE	NG/L	50.0	60000	(A2)
DESETHYL ATRAZINE	NG/L	200.0	60000	(A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300	(G)
CYANAZINE (BLADEX)	NG/L	100.0	10000	(A2)
DIELDRIN	NG/L	2.0	700	(A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000	(D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000	(D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
ENDRIN	NG/L	5.0	1600	(D3)
GAMMA CHLORDANE	NG/L	2.0	7000	(A1)
HEPTACHLOR	NG/L	1.0	3000	(A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000	(A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000	(D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000	(A1)
METHOXYCHLOR	NG/L	5.0	900000	(A1)
METOLACHLOR	NG/L	500.0	50000	(A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000	(A1)
MIREX	NG/L	5.0	N/A	
P,P-DDD	NG/L	5.0	30000	(A1)
O,P-DDT	NG/L	5.0	30000	(A1)
P,P-DDT	NG/L	5.0	30000	(A1)
P,P-DDE	NG/L	1.0	30000	(A1)
OXYCHLORDANE	NG/L	2.0	N/A	
PCB	NG/L	20.0	3000	(A2)
PROMETONE	NG/L	50.0	52500	(D3)
PROMETRYNE	NG/L	50.0	1000	(A2)
PROPAZINE	NG/L	50.0	700000	(D3)
SIMAZINE	NG/L	50.0	10000	(A2)
DESETHYL SIMAZINE	NG/L	200.0	10000	(A2)
TOXAPHENE	NG/L	500.0	5000	(A1)

PHENOLICS

PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A	

SPECIFIC PESTICIDES

2,4 D PROPIONIC ACID	NG/L	100.0	N/A	
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000	(A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A	
2,4,5-TP (SILVEX)	NG/L	20.0	10000	(A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000	(D3)
CARBARYL (SEVIN)	NG/L	200.0	90000	(A1)
CARBOFURAN	NG/L	2000.0	90000	(A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000	(G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A	
DIALLATE	NG/L	2000.0	N/A	
DIAZINON	NG/L	20.0	20000	(A1)
DICAMBA	NG/L	50.0	120000	(A1)
DICHLOROVOS	NG/L	20.0	N/A	
EPTAM	NG/L	2000.0	N/A	
ETHION	NG/L	20.0	35000	(G)
IPC	NG/L	2000.0	N/A	
MALATHION	NG/L	20.0	190000	(A1)
METHYL PARATHION	NG/L	50.0	9000	(D3)
METHYLTRITHION	NG/L	20.0	N/A	
MEVINPHOS	NG/L	20.0	N/A	
PARATHION	NG/L	20.0	50000	(A1)
PHORATE (THIMET)	NG/L	20.0	2000	(A2)
PICHLORAM	NG/L	100.0	190000	(A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000	(D3)
RELDAN	NG/L	20.0	N/A	
RONNEL	NG/L	20.0	N/A	

VOLATILES

1,1-DICHLOROETHANE	UG/L	0.10	N/A	
1,1-DICHLOROETHYLENE	UG/L	0.10	7	(D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200	(A1)
1,2-DICHLOROETHANE	UG/L	0.05	5	(A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5	(D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750	(D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5	(A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200	(D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6	(D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17	(D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BENZENE	UG/L	0.05	5	(A1)
BROMOFORM	UG/L	0.20	350	(A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5	(A1)
CHLOROBENZENE	UG/L	0.10	1510	(D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350	(A1+)
CHLOROFORM	UG/L	0.10	350	(A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70	(D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350	(A1+)
ETHYLENE DIBROMIDE	UG/L.	0.05	50	(D1)
ETHYLBENZENE	UG/L	0.05	2.4	(A3)
M-XYLENE	UG/L	0.10	300	(A3*)
METHYLENE CHLORIDE	UG/L	0.50	50	(A1)
O-XYLENE	UG/L	0.05	300	(A3*)
P-XYLENE	UG/L	0.10	300	(A3*)
STYRENE	UG/L	0.05	100	(D1)
TETRACHLOROETHYLENE	UG/L	0.05	65	(A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70	(D1)
TOLUENE	UG/L	0.05	24	(A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350	(A1)
TRICHLOROETHYLENE	UG/L	0.10	50	(A1)
VINYL CHLORIDE	UG/L	0.10	2	(D1)
RADIONUCLIDES				
TRITIUM	BQ/L	7.0	40000	(A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55#	(D1)
GROSS BETA COUNT	BQ/L	0.04	N/A	
COBALT 60	BQ/L	0.70	N/A	
CESIUM 134	BQ/L	0.70	N/A	
CESIUM 137	BQ/L	0.70	50	(A1)
IODINE 131	BQ/L	0.70	10	(A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:
- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP
system, printouts of the completed analyses are sent to the MOEE District Officer, the
appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired
through a questionnaire and an initial plant visit. During the initial assessment of
the plant and distribution system, questionnaire content is verified and missing
information added. It is intended that all data be kept current with scheduled annual
updates.

The Plant and Distribution System Description consists of the following seven
components:

1. PROCESS COMPONENT INVENTORY
All physical and chemical processes to which the water is subjected, from the intake
pipe to the consumers' tap (where possible), are documented. These include: process
type, general description of physical structures, material types, sizes, and retention
time for each process within the plant. The processes may be as simple as transmission
or as complex as carbon adsorption.

2. TREATMENT CHEMICALS
Chemicals used in the treatment processes, their function, application point, supplier
and brand-name are recorded. Chemical dosages applied on the day of sampling are
recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS
Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine
residuals, pH, aluminum residuals) including methods used, monitoring locations and
frequency is contained in this section. Except for the recorded Field Data, in-plant
monitoring results are not retained in DWSP but are retained by the water treatment
plant personnel.

4. DESIGN FLOW AND RETENTION TIME
Hydraulic capacity, designed and actual, is noted here. Retention time (the time that
a block of water is retained in the plant) is also noted. Maximum, minimum and average
flow, as well as a record of the flow rate on the day of sampling, are recorded in
DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION
This area includes the storage and transmission characteristics of the distribution
system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

    i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

    ii/ the water being sampled is not being modified by the sampling system;

    iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

    iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#:   71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 μg/L

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
                               CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF
                               HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN
                               WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
                               THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
                               THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
                               ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS
                               AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT
                               A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES,
                               SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM
                               SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR
                               DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES;
                               COMBUSTION OF CAR EXHAUST.
                               ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER
                               COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND
                               RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING
                               AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING
                               BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION
                               WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION,
                               COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION,
                               OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
                               MELTING POINT: 5.5^{o}C (27)
                               BOILING POINT: 80.1^{o}C (27)
                               SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
                               VAPOUR PRESSURE: 100 MM AT 26.1^{o}C (27)
                               HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
                               LOG OCT./WATER PARTITON COEFFICIENT: 1.95 TO 2.13 (39)
                               CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
                               SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry

-500 mL plastic bottle (PET 500)
-rinse bottle and cap with sample water three
 times
-fill to 2 cm from top

Bacteriological

-220 mL plastic bottle with white seal on cap
-do nót rinse bottle, preservative has been added
-avoid touching bottle neck or inside of cap
-fill to top of red label as marked

Metals

-500 mL plastic bottle (PET 500)
-rinse bottle and cap three times
-fill to 2 cm from top
-add 10 drops nitric acid (HNO_3)
 (**Caution:** HNO_3 is corrosive)

Volatiles (duplicates)
(OPOPUP)

-45 mL glass vial with septum
 (teflon side must be in contact with sample)
-do not rinse bottle
-fill bottle completely without bubbles

Organics
(OWOC),(OWTRI)

-1 L amber glass bottle per scan
-do not rinse bottle
-fill to 2 cm from top

Specific Pesticides
(OWCP),(PEOP),(PECAR)

-as per Organics
-three extra bottles must be filled

Polyaromatic hydrocarbons
(OAPAHX)

-1 L amber glass bottle per scan
-do not rinse bottle
-fill to 2 cm from top
-add 25 drops of sodium thiosulphate

Cyanide (Treated only)

-500 mL plastic bottle (PET 500)
-rinse bottle and cap three times
-fill to 2 cm from top
-add 10 drops sodium hydroxide (NaOH)
 (**Caution:** NaOH is corrosive)

Mercury

-250 mL glass bottle
-rinse bottle and cap three times
-fill to top of label
-add 20 drops each nitric acid (HNO_3)
 and potassium dichromate ($K_2Cr_2O_7$)
 (**Caution:** HNO_3&$K_2Cr_2O_7$ are corrosive)

Phenols   -250 mL glass bottle
                                     -do <u>not</u> rinse bottle, preservative has been added
                                     -fill to top of label

Radionuclides   -4 L plastic jug
(as scheduled)   -do <u>not</u> rinse, carrier added
                                     -fill to 5 cm from top

Organic Characterization   -1 L amber glass bottle; instructions
(GC/MS - once per year)   as per organic
(PBVOL),(PBEXT)   -250 mL glass bottle
                                     -do <u>not</u> rinse bottle
                                     -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.

2. Record time of day on submission sheet.

3. Record temperature on submission sheet.

4. Fill up all bottles as per instructions.

5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry   -500 mL plastic bottle (PET 500)
                                     -rinse bottle and cap with sample water three
                                      times
                                     -fill to 2 cm from top

Metals   -500 mL plastic bottle (PET 500)
                                     -rinse bottle and cap three times
                                     -fill to 2 cm from top
                                     -add 10 drops nitric acid (HNO_3)
                                      (**Caution: HNO_3 is corrosive**)

Steps:

1. Record time of day on submission sheet.

2. Place bucket under tap and open cold water.

3. Fill to predetermined volume.

4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on
   submission sheet.

iii) Distribution Samples (free flow)

General Chemistry
-500 mL plastic bottle (PET 500)
-rinse bottle and cap with sample water three
 times
-fill to 2 cm from top

Bacteriological
-250 mL plastic bottle with white seal on cap
-do not rinse bottle, preservative has been added
-avoid touching bottle neck or inside of cap
-fill to top of red label as marked

Metals
-500 mL plastic bottle (PET 500)
-rinse bottle and cap three times
-fill to 2 cm from top
-add 10 drops nitric acid HNO_3
 (Caution: HNO_3 is corrosive)

Volatiles (duplicate)
(OPOPUP)
-45 mL glass vial with septum
 (teflon side must be in contact with sample)
-do not rinse bottle, preservative has been added
-fill bottle completely without bubbles

Organics
(OWOC)
-1 L amber glass bottle per scan
-do not rinse bottle
-fill to 2 cm from top

Polyaromatic Hydrocarbons
(OAPAHX)
-1 L amber glass bottle per scan
-do not rinse bottle
-fill to 2 cm from top
-add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on
   submission sheet.